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Analysis and synthesis

French insurers facing the risks associated with biodiversity loss: Challenges and lessons learned for the insurance industry and supervisors

ACPR
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OVERVIEW

This article sets out the main challenges associated with and transmission channels of biodiversity loss-related risks in the insurance industry. Although the insurance business in and of itself is not directly dependent on ecosystem services and has a very limited impact on biodiversity loss, insurers are nonetheless significantly exposed to it indirectly: on the one hand, through their investments in companies that are highly dependent on ecosystem services, which exposes them to risks on the return on their assets as well as to credit or counterparty risks; on the other hand, through the provision of insurance or reinsurance services to these companies that are highly dependent on ecosystem services or have a detrimental impact on biodiversity and are therefore exposed to risks of financial loss. This article also provides an initial assessment of the reporting required of insurers with regard to the risk of biodiversity loss in the context of the implementation of the European SFDR (Sustainable finance disclosure regulation) and Article 29 of the French energy and climate Law, which is a step ahead of the market. This analysis shows that while the French insurance industry has made progress in its integration of biodiversity risk, insurers still face significant challenges, particularly in relation to how the concept of "dependence on ecosystem services" is understood, making its application to financial intermediaries difficult in practice. Other challenges include the complexity associated with assessing the financial and non-financial impacts of a concept that is difficult to measure, both due to the lack of a consensual approach or commonly agreed indicators and due to its own distinctive characteristics (presence of non-linearity and irreversibility, non-substitutability, dynamics that are both global and highly localised, etc.). The article concludes with a number of recommendations aimed at improving the inclusion, transparency and quality of insurers' disclosures on biodiversity risk.

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SUMMARY

Introduction

In the wake of the many studies devoted to taking account of the risks associated with climate change and gradually integrating them into the risk management framework of financial institutions, the risks arising from the loss of biodiversity are becoming increasingly important in the discussions held between industry players and French financial regulators.

Both Europe and France, most notably through its climate and energy Law and Article 29 ("Article 29LEC"), have introduced a completely new framework, as well as reporting requirements for life insurance companies and supplementary occupational pension funds. Although the European and French regulatory frameworks are primarily aimed at establishing transparency rather than performance requirements, the institutions subject to them are nonetheless required to gradually measure their dependence on, and impact on, biodiversity, defined here as the variety of life on Earth (which includes biological diversity within species, between species and diversity within ecosystems)[2].

Hence, in France, in 2022, life insurers and supplementary occupational pension funds have submitted their first report outlining their sustainability risk policy, pursuant to Article 29LEC[3].

The various categories of disclosures to be included in this report[4] include "the strategy for alignment with long-term biodiversity targets" and the integration of biodiversity into the risk management framework. The requirement for insurers to disclose information on this matter is indicative of the recent awareness, among all economic and political decision-makers, of the potential risks to economic activity and financial stability posed by the loss of biodiversity.

The aim of this study is twofold. Its first section introduces a number of concepts related to biodiversity and biodiversity loss, and then endeavours to explain the ways in which insurance undertakings are exposed to the risks arising from the loss of biodiversity. The second section provides an account of the implementation of Article 29 of the energy and climate Law focusing on the biodiversity-related disclosure requirements, based on disclosures made by reporting entities in 2022 and 2023. It also draws lessons from a working group on biodiversity held in spring 2023 under the aegis of the ACPR's Climate and Sustainable Finance Commission. It concludes with a number of recommendations aimed at insurers.

[2] CBD (1992).

[3] Article 29LEC applies to financial institutions carrying out third-party asset management business. It covers three types of players: asset management companies; insurance undertakings -mainly in the life insurance segment-, and supplementary occupational pension funds; credit institutions and investment firms as regards their discretionary portfolio management and investment advice activities.

[4] The various categories of information to be disclosed (including regarding biodiversity) are listed in section III of Article D. 533_16_1 of the French monetary and financial Code: Decree No 2021-663 of 27 May 2021 implementing Article L. 533-22-1 of the French monetary and financial Code - Légifrance (legifrance.gouv.fr).

Insurers facing the risks associated with biodiversity loss

1. The economic approach to biodiversity loss

The International Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) defines biodiversity as "*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 within and among species, biological communities and ecosystems*". Observed biodiversity loss is both substantial and rapid, so much so that scientists now agree that a sixth mass extinction is underway. Human consumption, production, trade and technological innovation since the industrial revolution are the primary drivers of this loss in biodiversity. More specifically, the pressures that these activities exert on biodiversity can be broken down into five main categories: (i) changing use of sea and land, (ii) direct exploitation of living organisms, (iii) climate change, (iv) pollution and (v) the spread of invasive alien species.

Under the standard economics approach to biodiversity, there is considered to be a stock of "natural capital" that produces flows of "ecosystem services"[5], which are grouped by the IPBES into three main types, altogether totalling 18 ecosystem services: (i) provisioning services, such as food, fuel and drinking water; (ii) regulating services, such as pollination, hydrological cycle regulation, climate stability, water, air and soil quality, regulating diseases and pests, extreme events prevention and fight against oceans pollution; and (iii) intangible contributions, such as genetics or habitat creation and maintenance, etc. According to the IPBES, 14 of the aforementioned ecosystem services are now on a declining trend[6].

Economic analysis postulates that all production, consumption and trade activities are closely linked to biodiversity, insofar as these activities are dependent on the contributions produced by ecosystem services. Indeed, the World Economic Forum estimates that more than 50% of global annual GDP is either moderately or highly dependent on ecosystem services[7]. Yet, biodiversity loss undermines the capacity of nature and ecosystems to provide these services, which entails, in turn, an increase in economic, social and financial risks.

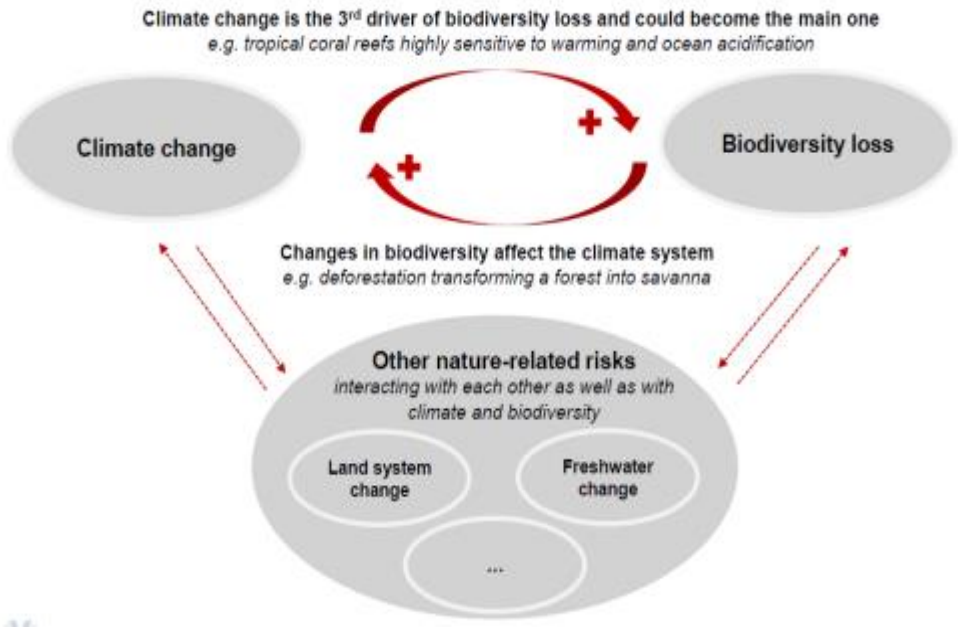
[5] "Biodiversity loss and financial stability: a new frontier for central banks and financial supervisors?" Banque de France Bulletin, November 2021.

[6] The global assessment report on biodiversity and ecosystem services, IPBES, 2019.

[7] Nature Risk Rising: Why the Crisis Engulfing nature Matters for Business and the Economy, January 2020.

2. Interactions between decline in biodiversity and climate change

Figure 1 Interactions between climate change, biodiversity and other nature-related risks



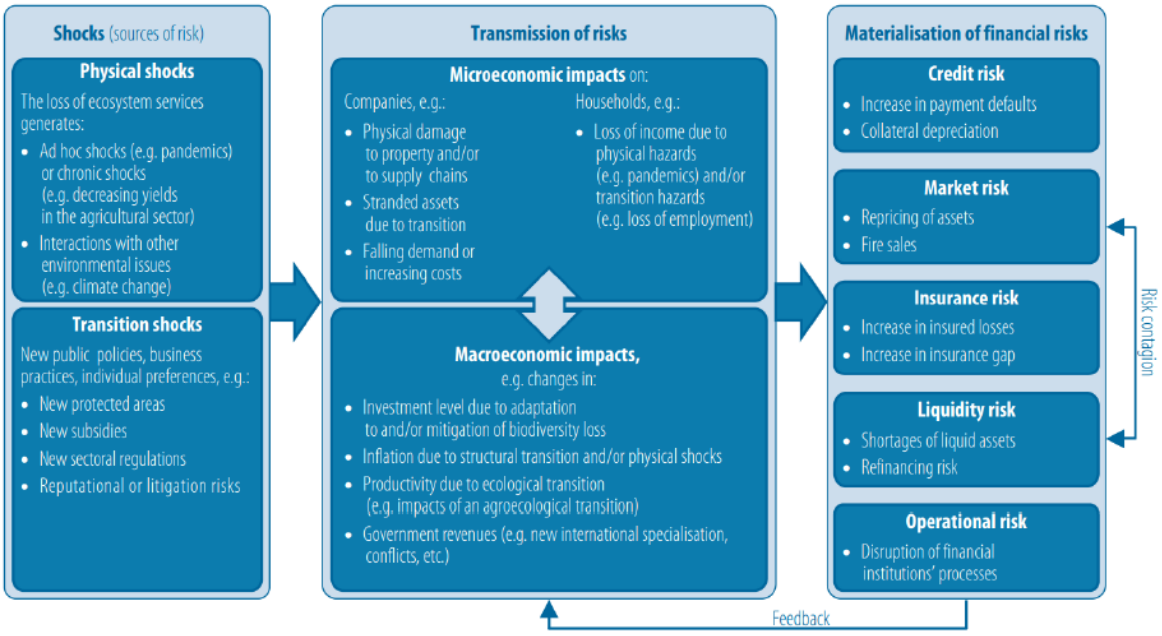
Source: DNB-OMFIF Conference on biodiversity, Amsterdam, 29 September 2022, "Biodiversity, macroeconomics and finance: what we do know, what we don't know yet, and what we have to do", speech by François Villeroy de Galhau

Climate change is one of the pressures exerted by human activities on biodiversity. Rising temperatures and variations in precipitation disrupt wildlife and plant habitats, growth seasons and population sizes, leading to the disappearance and extinction of species. Moreover, the loss of biodiversity and climate change are strongly interconnected and have mutual feedback effects going well beyond a simple cause-and-effect relationship: not only is climate change the third most significant factor in the decline in biodiversity, but it is also affected itself, in turn, by this loss. Indeed, biodiversity is essential for carbon sequestration, as carbon is stored in trees, soils and other landmasses.

Marine ecosystems also play an equally important role in absorbing emissions and heat. These interactions combine with one another, and can lead to the amplification of other risks: for instance, both climate change and changes in land use lead to imbalances in freshwater availability.

However, there may be some tension, or even conflict, between these two objectives: for example, the fight against climate change may lead to investment choices or to the construction of infrastructures that are likely to harm biodiversity (hydropower dams, etc.).

Figure 2 Transmission channels of financial risks linked to biodiversity loss



Source : Svartzman and al., 2021, « A Silent Spring for the Financial System ? Exploring Biodiversity –Related Financial Risks in France », Working Paper Series no. 826, Banque de France

3. The risks associated with biodiversity loss for the financial sector as a whole and insurers in particular

3.1 Physical risks, transition risks

The loss of contributions provided by ecosystem services as a result of biodiversity loss may lead to economic and financial risks. On that matter, the TNFD[8] (Taskforce on Nature-related Financial Disclosures) defines nature-related risks as "the potential threats posed to an organisation linked to its and other organisations' dependencies on nature and nature impacts". More recently, the NGFS (Network for Greening the Financial System) has developed a conceptual framework aiming to (i) develop a common science-based understanding of, and language for, the analysis of nature-related risks, (ii) assess these risks, (iii) provide a micro- and macroprudential analysis, as well as a macroeconomic analysis of nature-related risks and (iv) propose, in the near future, a refined conceptual framework, notably in terms of data and indicators, as well as the design of scenarios for nature-related risks[9].

As with risks stemming from climate change, risks arising from biodiversity loss can be grouped into two broad categories: (i) physical risks and (ii) transition risks. As for liability risks, they can be categorised as physical risks (for instance, in the event of environmental degradation or biodiversity loss) or transition risks (reputational risk or legal risk in the event of regulatory changes).

Physical risks related to biodiversity loss are a direct result of organisations' dependencies on ecosystem services, as well as of direct contact between people and their natural environment (fauna and flora). These risks can be chronic (e.g. agricultural yield losses linked to the gradual decline of pollinator population) or acute (e.g. emergence of zoonotic diseases -infectious diseases of animal origin that are communicable to humans- and pandemic outbreaks as a result of deforestation). These physical risks may arise due to the impact of climate-related events (drought, flooding), geological events (earthquake) or alterations to ecosystem balance (changes to soil and ocean quality).

Transition risks arise from the misalignment of a company's strategic and governance policies with changes to the regulatory, economic, technological and legal environment in which it operates. This is especially true when changes made in this context aim to halt damage to biodiversity or even reverse the process leading to biodiversity loss. These changes may include policy and regulatory changes, changes in consumer preferences, and the introduction of new technology.

[8] The initiative, which was launched in June 2021, following the internationally recognised TCFD (Task Force on Climate Related Financial Disclosures), issued its first set of recommendations in March 2022, and introduced an analytical framework dedicated to nature-related risks and opportunities, as well as recommendations for the assessment and reporting processes aimed at businesses and financial institutions.

[9] Both the NGFS and the TNFD use the term "nature-related" risks, rather than biodiversity-related risks. The concept of nature is broader than that of biodiversity, insofar as it relates to both the living and non-living elements that can be found on Earth, therefore including biodiversity and climate. These living and non-living elements precisely form the ecosystems providing the aforementioned services. Nature's capacity to provide these services relies on biodiversity.

3.2 Impacts on the real economy and transmission to the financial sector

The transmission of these physical and transition risks to the real economy occurs through a wide array of channels affecting both individuals and firms[10], such as physical damage to assets or supply chains, stranded assets, reduced income or loss of income, rising production costs, etc.

For instance, a business that is affected by a physical shock caused by biodiversity loss may face operational risks if it is forced to either stop or slow down its business as a consequence of a loss of access to specific ecosystem services (raw materials, water, fertile soil, etc.), while its repayment capacity will be reduced (credit risk), alongside with the value of its assets and shares (market risk), as applicable. In the event of a transition shock, companies the strategy of which is inconsistent with regulatory developments relating to the preservation of biodiversity may incur losses stemming from sanctions, stranded assets, and the payment of damages and/or taxes. Their access to market financing could be limited, at the same time as they may incur reputational risks.

The analysis of the financial risks associated with biodiversity mainly relies on the assessment of the physical and transition risks described above and their transmission to economic agents and then to financial institutions. These financial risks may take many forms, notably including: (i) credit risks, comprising defaults and the depreciation of collateral; (ii) market risks, which refer to the risk of asset losses or impairment, (iii) liquidity risks and (iv) underwriting risks, including both the risk of increased insured losses and that of increased insurance gap.

However, the assessment of these risks is made difficult by the fact that the erosion of biodiversity and the decline of ecosystem services constitute eminently complex phenomena:

- They entail a multitude of causes and impacts;
- They encompass both global and highly localised risks;
- They are characterised by high uncertainty regarding the time horizon beyond which a "catastrophic tipping point" would be irreversibly crossed;
- They involve tail risks associated with non-linearities;
- Ecosystem services have limited substitutability.

This complexity leads to a lack of consensus on a method to assess dependencies and impacts on biodiversity[11], as well as difficulties in defining metrics used to quantify the resulting risks.

Furthermore, in the case of French intermediaries, and more particularly that of insurers, dependencies to and impacts on biodiversity are indirect[12]: indeed, the provision of insurance services depends only marginally on ecosystem services, and has no impact, as such, on biodiversity[13]. Insurance undertakings are only exposed through their investments and the coverage they provide to companies.

10 Banque De France Bulletin of November 2021 and Svartzman et al., 2021

11 "Assessment tools and indicators: assessing the impact of human activities on biodiversity?" French Foundation for Biodiversity Research (FRB), 2021, page 18.

12 The direct risks insurers may face are predominantly transition risks: they would be exposed to them if they were not sufficiently prepared to adapt to changes to the economic and regulatory environment aimed at mitigating or halting biodiversity loss. As for direct physical risks, the exposure of insurance undertakings is very limited: as their business is exclusively based on the provision of services, their infrastructure (offices, etc.) is the only element that could potentially suffer physical shocks stemming from biodiversity loss.

13 At the same time, from the perspective of insurers' direct biodiversity footprint, insurance undertakings can contribute to the artificialisation of soil through their footprint (buildings).

Despite these limitations, work carried out jointly by the Banque de France, the French Biodiversity Agency (OFB), the French Development Agency (AFD) and CDC Biodiversité[14], based on the methods used by the Central Bank of the Netherlands[15] (DNB), endeavours to carry out a quantified assessment of physical and transition risks on the assets of French financial institutions[16]:

- The exposure of financial institutions to the physical risks related to biodiversity loss is estimated by measuring the dependencies of those companies the securities of which are held by French financial institutions on various ecosystem services. The underlying assumption is that the more dependent a firm's production is on specific ecosystem services, the more likely it is to be affected by a disruption to the provision of such services. This is how financial institutions' assets are themselves exposed to physical risk;
- The exposure of financial institutions to transition risks related to biodiversity loss is estimated by measuring the impact of biodiversity on the production of those companies the securities of which are held by French financial institutions. The underlying assumption is that the greater the impact of a company's activity on the decline of biodiversity, the more likely it is to be affected by changes in the regulatory, economic or legal environment aimed at halting this decline.

3.3 The specific stakes of biodiversity decline for the insurance sector

Through their investment (on the assets side) and risk coverage (on the liabilities side) activities, insurance undertakings are indirectly exposed to the physical and transition risks stemming from biodiversity loss. The extent of the financial consequences that indirect exposure may have can vary for at least two reasons: (i) the fact that insurers, and particularly life insurers, are among the largest institutional investors and make a significant contribution to the financing of entities across all business sectors and geographical areas; (ii) the nature of their insurance business, which involves, in return the payment of a premium, assuming the risk of potential loss and providing financial compensation should this risk materialise; this activity reflected on the liabilities side is facing a potential increase in both physical and transition risks as a result of the loss of biodiversity.

Indirect risks to which insurers are exposed therefore include all physical and transition risks stemming from the loss of biodiversity that affect (i) policyholders (liabilities side) and (ii) entities in which insurers make financial investments (assets side).

14 Svartzman et al., 2021.

15 Van Toor et al., 2020.

16 BDF Bulletin of November 2021.

- ***On the liabilities side***

The main risks associated with the loss of biodiversity and likely to affect insurers' liabilities fall into two categories[17]:

- Underwriting risk: an unanticipated increase in the frequency, scale and sectoral and/or geographical concentration of claims repayment amounts could lead to imbalance in the combined ratio (total costs as reflected in the loss ratio);

- Potential insurance gap risk: the decline in biodiversity further complicates the setting of insurability criteria[18], given that: (i) it remains, to date, very difficult to measure; (ii) its very nature implies that it affects a whole range of economic sectors or geographical areas, that may lead to a correlation of risks that were previously independent; (iii) it is changing in a non-linear manner (tipping points) and entails potentially systemic repercussions due to which there is no readily determinable maximum loss estimate the maximum losses that may arise in turn.

A significant number of insurers' liabilities are exposed to these risks[19]:

- Health and long-term savings activities: the erosion of biodiversity is notably reflected in the decline in ecosystem services providing regulation and support. The most striking examples of this decline are the reduced protection of air quality, the loss of efficiency of climate regulation, reduced water flow regulation, reduced protection of soils, diminished resistance to disease and the dwindling numbers of pollinator insects. The consequences of these phenomena for insurers' health/death & long-term savings business is manifold: rising levels of bodily injury, chronic illness and premature mortality, and the emergence of new diseases, increased pandemic risk, health effects associated with insufficiently diversified diets, even a risk of famine (falling crop yields for lack of pollination), etc.
- Property damage business: once again, should the focus be solely on regulatory and support services, the consequences for the property damage business could be significant, as natural disasters increase in frequency, intensity and cost, along with operating losses (business disruption, slowdown, or even lasting disruption of global value chains).

- ***On the assets side***

On the assets side, the investment business is affected by the physical and transition risks associated with the loss of biodiversity that affect the entities held in the insurers' investment portfolios. The difficulty of assessing nature-related risks and incorporating them into the risk measurement of a financial portfolio can substantially distort the risk level of the portfolio, as well as that of the insurance undertaking as a whole. Contrary to the situation on the liabilities side, there are no specific characteristics that distinguish insurers from other financial institutions when it comes to the impact of biodiversity on their asset portfolios. In very general terms, the investment activities of insurers could be adversely affected by a drop in the financial return generated by the securities held in their portfolios, this decline itself reflecting the impact of biodiversity loss on the firms issuing these securities and/or the harmful effect these firms have on biodiversity. The drop in returns would be even sharper if the businesses financed in this way by insurers were dependent on the ecosystem services provided by biodiversity.

[17] Chandellier J., Malacain M, 2021, Biodiversity and re/insurance: an ecosystem at risk, Muséum national d'Histoire naturelle, Paris.

[18] Several criteria have to be met in order to determine whether a risk is insurable, among which, in particular, the fact that it is quantifiable, that the associated average (maximum) loss is moderate (sustainable) and that the probabilities of the various potential losses are independent.

[19] For a comprehensive overview of the consequences of the decline in ecosystem services for insurers' assets and liabilities, cf. France Assureurs, *Assurance et biodiversité : enjeux et perspectives*, September 2021 and SCOR, *Biodiversity and Reinsurance: an Ecosystem at Risk*, April 2021. Reference can also be made to the paper published by the EIOPA (2023).

The impact on insurers' assets involves the following channels:

- *Credit risk* refers to the deterioration in the debt repayment capacity of companies the securities of which (debt securities, bonds) appear under insurers' assets. This deterioration can arise as a result of a physical shock, such as the loss of access to ecosystem services (supply of raw materials, water, etc.), leading to business disruptions or even to the cessation of activities for the company concerned. Credit risk may also arise as a result of a transition shock, in the form of sanctions, taxes or the payment of damages triggered by new regulations that impose stricter limits on the adverse impact of companies on biodiversity. All in all, creditor insurers face both the risk of lower returns and, in the most extreme cases, the risk of default by the companies invested in.
- *Market risk* arises from the deterioration of the value of assets, as well as from reduced market access for companies that are heavily dependent on ecosystem services and/or have adverse effects on biodiversity. Biodiversity loss can also contribute to a slowdown and higher inflation on a wider scale, exerting downward pressure on financial returns.
- *Liquidity risk* could arise in the event of a sudden disruption to ecosystem services, increasing liquidity needs. However, insurers are less exposed to such disruptions than banking institutions, which could face bank runs.
- *Solvency risk* refers to the difficulties that insurers may encounter in complying with the requirements laid down in the Solvency II directive, due to losses in asset value and/or the failure of companies financed by insurance undertakings that are not included in the required solvency capital.

French insurers factoring in biodiversity: stock-taking and recommendations

Starting in June 2022, Article 29 of the energy and climate Law and the European Sustainable Finance Disclosure Regulation require insurers to disclose information on their integration of biodiversity issues. It is a challenging new framework, ahead of market practices, but which is being gradually implemented. As part of its mandate, the ACPR has analysed the reports published in June 2022 by 47 insurers and mutual insurers, as well as those published in June 2023 by 113 reporting institutions.

After providing a reminder of the regulatory context and the nature of the information to be disclosed, this section provides an overview of the information on biodiversity-related risks contained in the reports[20].

1. Legal requirements: entities concerned and information required to take biodiversity risks into account

Undertakings subject to ACPR supervision and covered by this law are life insurers, supplementary occupational pension funds and institutions for occupational retirement provision (respectively FRPS and ORPS), mutual insurers and provident institutions (IP) carrying out life insurance or composite activities, with a balance sheet or outstanding amounts in excess of EUR 500 million. Article 29 LEC also applies to banks in respect of their management activities on behalf of third parties. The disclosures made by these entities are subject to controls carried out by the French Financial Markets Authority (AMF). The regulation also applies to each collective investment undertaking and management mandate managed by these entities for which the outstanding amount exceeds EUR 500 million.

Part III, subparagraph 7 of Decree No. 2021-663 implementing Article L. 533-22-1 of the French monetary and financial Code, as amended by Article 29 of the energy and climate Law of 2019, introduces disclosure requirements starting in June 2022 (over data for the financial year 2021) as regards the strategy for alignment with the long-term biodiversity-related targets of the institutions concerned.

More specifically, the disclosures made in relation to this alignment strategy shall include:

(i) An assessment of compliance with the targets set by the Convention on Biological Diversity[21] (CBD);

(ii) an analysis of their contribution to reducing the main pressures and impacts on biodiversity according to the definition set by the IBPES[22];

[20] This stocktaking is an excerpt from the ACPR's assessments of compliance with Article 29LEC carried out in 2023 based on the 2022 "29LEC" disclosures and in 2024 based on the 2023 "29LEC" disclosures.

[21] The Convention on Biological Diversity is an international treaty opened for signature in 1992, at the United Nations Conference on Environment and Development, also known as the Rio "Earth Summit". To date, 196 Parties have signed it.

[22] The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an intergovernmental body established in 2012. It is the equivalent of the IPCC for biodiversity-related matters.

(iii) a mention of their reliance on a biodiversity footprint indicator and, as applicable, the way this indicator allows for the assessment of compliance with international biodiversity targets. Entities concerned shall also specify the scope retained for the value chain, present their targets by 2030 that should be reviewed every five years, and favour disclosures on a entity-by-entity basis rather than at group level.

Subparagraph 8 of the same Decree introduced, as of June 2023 (covering data for the financial year 2022), a requirement to disclose information on the steps taken towards the inclusion of environmental, social and governance quality (ESG) criteria in their risk management procedures, including specific provisions for biodiversity-related risks.

Risks related to biodiversity loss are regarded as ESG risks. As such, they should be integrated into standard risk management procedures and subject to instructions to strengthen disclosure items. As part of this process, undertakings shall indicate how they account for ESG-related risks, including in particular the processes used to identify, assess, prioritise, measure and analyse them, how frequently they are updated, what their action plan is to mitigate their impact, and an estimate of their financial impact.

In addition, the law requires the disclosure of methodological evidence specific to biodiversity risks[23]. These methodological elements include:

- A distinction between risks arising from the impacts of the investment strategy and risks arising from the biodiversity dependencies of assets and activities in which the entity concerned has invested.
- The value chain scope they retained should also be disclosed, as should the nature of risks (business sector or geographical area of the underlying asset).

Stakeholders involved shall comply with these new requirements following the "comply or explain" rule: they are required to disclose the requested information and, should they fail to do so, they are required to submit a plan for the improvement of each missing disclosure item. The plan shall include (i) identified opportunities for improvement to the current strategy, and the associated concrete steps taken to improve it, (ii) information on the strategic and operational changes either already introduced or to be introduced as a result of the implementation of corrective steps and (iii) time-bound targets for the implementation of each of those elements.

Through these provisions, Article 29LEC overlaps with and supplements the SFDR, which also introduces biodiversity-related criteria in its definition of sustainable investment (Article 2) and on key adverse sustainability impacts (described in the implementing technical standards[24]).

2. Analysis of information included n 29LEC reports

As a preliminary point, the analysis of reports published in 2022 and 2023 shows that biodiversity concerns are the least addressed issue in the 29LEC reports of insurers. Among those insurers that did address it, the amount and quality of information disclosed varies greatly from one undertaking to the next. Some insurers providing very detailed information on their internal policy, while others only broached that topic summarily, and it was often overlooked among biodiversity considerations of a more general nature.

Yet, the 2023 29LEC reports highlight clear progress, as a majority of insurers address the topic of biodiversity within them. They have been able to produce a reporting based on available data and methodologies.

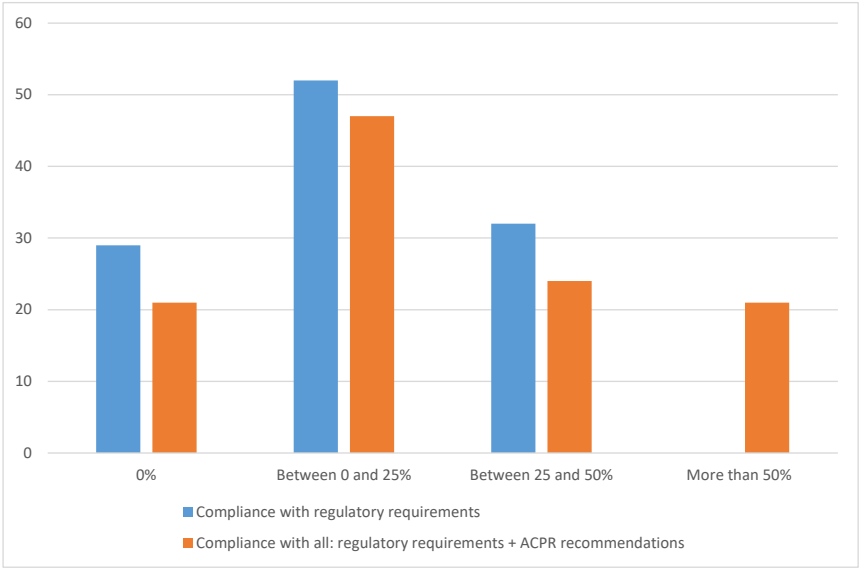
[23] Section III, subparagraph 8a(c) of Article D. 533-16-1 of the French monetary and financial Code.

[24] Delegated Regulation (EU) 2022/1288 of the Commission of 6 April 2022.

Only 21 out of 113 insurers (19%) do not address the topic of biodiversity at all in their 2023 reports. In the reports of insurers that do disclose such information, considerable variation is observed in terms of both the quality and quantity of provided evidence. For instance, 47 insurers (42%) disclose at most 25% of the information required and 24 insurers (21%) disclose between 25% and 50% of the information required. 21 insurers (19%) provide more than half of the information required, and only two of them disclose more than 80% of the information required.

When focusing solely on compliance with regulatory requirements, excluding the requested elements that are merely recommendations issued by the ACPR, the results are far less encouraging, which seems however normal, given the low maturity of the topic. The distribution of the percentage of information disclosed shifts to the left. More specifically, no insurer complies with more than 50% of regulatory requirements (see appendix 1 for the detailed required information and its nature).

Graph 1 - Breakdown of respondents according to the percentage of information completed for the biodiversity item



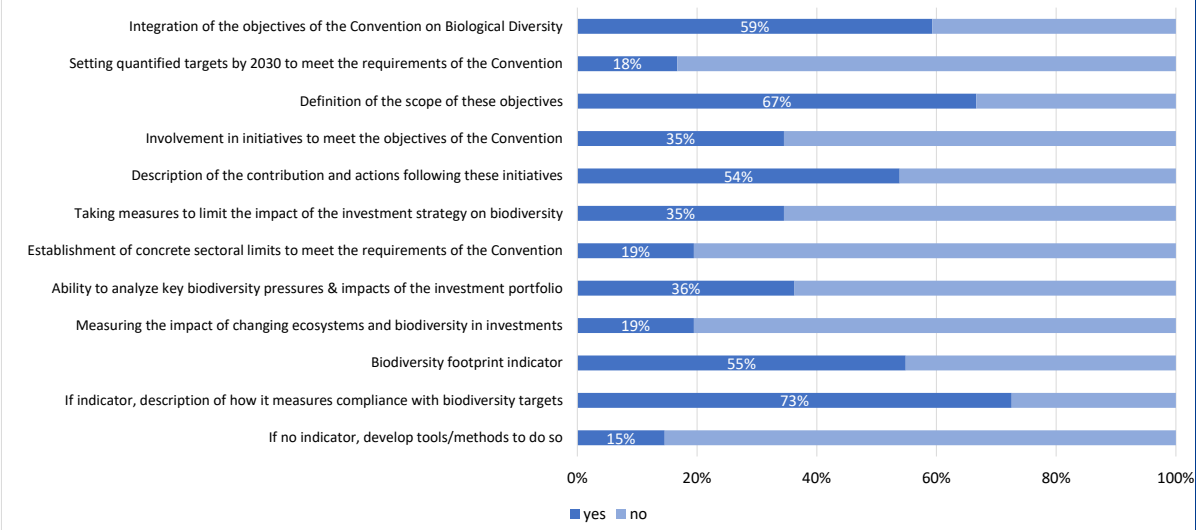
Reading aid: 32 insurers comply with 25% to 50% of biodiversity-related regulatory requirements, 24 insurers comply with 25% to 50% of all regulatory requirements and ACPR recommendations relating to biodiversity.

In the 29LEC reports submitted in 2022, the identification of the main pressures exerted by activities on biodiversity and the indicators used to assess the impact on or dependencies to biodiversity were only included by a minority, as were steps taken to limit the adverse impact of business on biodiversity. Conversely, in the 2023 reports, there was a marked increase in the number of insurers providing information on the impact of their activity on biodiversity. Indeed, 62 insurers (55%) provide biodiversity footprint indicators that enable them to measure the impact of their investment portfolios on biodiversity, and three quarters of those that provide such an indicator also indicate how it enables them to assess their compliance with biodiversity-related targets. In contrast, dependence on biodiversity stills seems to remain under-researched. In their defence, the notion of dependency is ill-suited to financial players because it is derived from a characterisation of the value chain that is applicable to non financial corporations. In the case of financial players and insurance undertakings, the notion of double materiality would make more sense. Indeed, it requires financial participants to take into account both the purely financial materiality of biodiversity loss on their earnings, and the impact of their activities on biodiversity and, beyond that, on the environment and on society.

The following elements provide, for the 2022 and 2023 reports, a review of disclosures required pursuant to section III, paragraph 7 of the implementing decree, i.e. (i) an assessment of compliance with the targets set out in the Convention on Biological Diversity, (ii) an analysis of contribution made to reducing the main pressures and impacts on biodiversity within the meaning of the IBPES definition, and (iii) a mention of the use of a biodiversity footprint Indicator and, where applicable, the way this indicator allows for the assessment of compliance with the international biodiversity targets.

The table below summarises the key information taken from the 2023 29LEC reports of the various insurers sampled and concerning their biodiversity strategy.

Graph 2 - Description of the biodiversity strategy: percentage of undertakings that provided answers for each required disclosure



2.1 Assessment of compliance with the targets set by the Convention on Biological Diversity

The Convention on Biological Diversity (CBD), an international treaty adopted on 5 June 1992 in Rio, at the United Nations Conference on the Environment and Development, established the following targets: (i) preservation of biological diversity, (ii) sustainable use of biological diversity, and (iii) fair and equitable sharing of benefits arising from the use of genetic resources.

2.1.1 Involvement in initiatives aiming to meet CBD targets and quantified targets

Of the 47 insurance undertakings that published a 29LEC report in 2022, around half of them stated that they were involved in initiatives aimed at complying with CBD targets, whether those initiatives be:

- national: "Biodiversity and natural capital" working group by Finance for Tomorrow, Biodiversity working group by France Assureurs, "Club B4B+", Business For Biodiversity Positive, organised by CDC Biodiversité;

Or international: Finance for Biodiversity Pledge, Taskforce on Nature-related Financial Disclosures (TNFD), the "Sustainable commodities practitioners' group*"* working group set by the UN's "Principles for Responsible Investment" initiative. Some reports also refer to partnerships with NGOs such as WWF or CDP. Of the 113 insurance undertakings that published a 29LEC report in 2023, 67 (59%) include compliance with the Convention on Biological Diversity (1992) in their targets.

Among all undertakings that include compliance with the aforementioned Convention in their targets, only 18% of them have set quantified targets by 2030 to meet the requirements set by the Convention. A few other insurers listed ongoing efforts on this topic that have yet to be finalised.

2.1.2 Measuring ESG risk linked to business dependencies on biodiversity

The measurement of ESG risk linked to business dependencies on biodiversity, which is part of the disclosures required of undertakings from financial year 2023 onward[25], was still mostly absent from 2022 reports. When it was included, it was mostly based on the ENCORE ("Exploring natural capital opportunities, risks and exposure") database.

The 2023 29LEC reports show that a vast majority of insurers (79%) do not provide information on the four items the disclosure of which is required as part of the inclusion of biodiversity in ESG risk.
For instance, only 15 out of 113 insurers (13%) identify the biodiversity-related risks arising from the impacts of their investment strategy, and only 17 of them (15%) identify the risks arising from the impact of biodiversity loss on the assets and activities in which they have invested.

2.2 Analysis of their contribution to reducing the main biodiversity pressures and impacts identified by the IPBES

2.2.1 Assessment of key biodiversity pressures and impacts

A minority of the 2022 29LEC reports included an assessment of the main pressures and impacts of the reporting undertaking's activities on biodiversity. Where such assessment was included, it relied, for the most part, on the use of footprint indicators obtained from external service providers. Moreover, the measurement of the main pressures and impacts was only calculated for a limited proportion of portfolios held by the reporting undertakings.

The 2023 29LEC reports show that 41 insurers (36%) are now able to assess the main biodiversity-related pressures[26] and impacts of their investment portfolios. Among those who are not yet able to do so, a few insurers stated that efforts to achieve this goal were scheduled for 2023-24.

2.2.2 Reducing pressure on biodiversity and engaging in activities with positive impacts

In the 2022 29LEC reports, undertakings seeking to limit the adverse impact of their activities on biodiversity typically stated that they would exclude certain types of activities from their investment policy, such as those linked to deforestation in certain areas (Sogecap in particular).

Activities with a positive impact, as listed in the 2022 reports, include, but are not limited to:

- investment in assets that contribute to protecting biodiversity (1 undertaking), especially forests (4 undertakings), so-called "impact" investments[27] (3 undertakings)
- investment in green bonds (3 undertakings),
- The creation of biodiversity funds (1 undertaking) or of specialised savings products (1 undertaking).

The 2023 29LEC reports show that in 2022, 39 insurers (35%) implemented measures to limit the impact of their investment strategies on biodiversity.
As was already the case in the 2022 reports, the measures taken and mentioned in the 2023 29LEC reports mainly involve the exclusion of specific activities and involvement in activities that have a positive impact on biodiversity. Examples of such measures include:

- The exclusion of specific companies, such as those involved in the production and distribution of palm oil (at least eight insurers); the exclusion of companies with a significant and highly controversial impact on biodiversity; or, in rarer cases, announcements of a plan to gradually reduce their exposure to certain fossil fuels
- The implementation of policies for the sound management of the natural environment, including for instance the "**rewilding"** of artificialised areas (at least 6 insurers)
- Investment in specific "green" assets:
  - Investment in "sustainable agriculture" bonds
  - Investment in green bonds
  - Commitment to funds supporting causes such as the preservation and restoration of biodiversity, "regenerative" agriculture, or tropical forest preservation

An insurer is currently considering excluding the biocides industry.

2.3 The mention of a biodiversity footprint indicator and, where applicable, of the way this indicator enables the relevant undertaking to assess its compliance with international biodiversity targets[28]

The biodiversity footprint assessment indicators mentioned in the 2022 or 2023 reports seem, for the most part, to be provided by external service providers, with a few exceptions. At times, the content of the 29LEC reports does not make it possible to ascertain the source of the indicator mentioned, and more particularly to know whether it was designed in-house or provided by an external service provider.

In the 2022 reports, the *Mean Species Abundance* (MSA) is the most frequently used metric cited by insurers. It provides a concise assessment of their impact on biodiversity. It is gradually becoming one of the most widely used tools among those recently designed for the assessment of impact on biodiversity.

[25] Subparagraph 8a of the Decree implementing Article D. 533-16-1 of the French monetary and financial Code.

[26] The IPBES identified these main pressures as follows: (i) Change in land use and sea use and habitat destruction; (ii) Overexploitation of resources; (iii) Climate change; (iv) Pollution (comprising *inter alia* plastic, chemical, sound, light and radioactive pollution); (v) Invasive alien species (ecosystem change, predation, disease, etc.)

[27] The Global Impact Investing Network (GIIN) defines "impact investing" as investment strategies that seek to generate financial returns while also having a measurable positive impact on society and the environment.

[28] For a comprehensive outline of the various biodiversity footprint indicators used and disclosed by the undertakings that have submitted a 29LEC report, refer to the box on page 16.

Other indicators derived from the MSA that integrate a sectoral approach are also cited in a number of 2022 reports.

These other indicators include the BIA-GBS developed by Carbon 4 Finance and CDC-Biodiversité, the Corporate Biodiversity Footprint developed by I Care & Consult and Iceberg Data Lab, and, lastly, the tools developed by MSCI as part of a more general-purpose ESG assessment.

Among the insurers that make no mention of a biodiversity footprint indicator in their 2022 reports, only a few have followed the "comply or explain" rule and therefore indicated that they have taken steps aimed at developing methods and tools to assess the impact of their activities on biodiversity.

In much the same way as in the 2022 reports, the 2023 reports quote most of the tools used to assess a biodiversity footprint, such as: the MSA or indicators that are similar to the MSA (at least 19 insurers, accounting for 17% of sampled insurers); the Global Biodiversity Score; Carbon4 Finance's BIA-GBS™ tool, which was built on the basis of the Global Biodiversity Score methodology; and the Corporate Biodiversity Footprint developed by I Care & Consult and Iceberg Data Lab. These various methodologies are described in Appendix 2.

Table 1 - Examples of indicators and metrics mentioned in some 29LEC reports submitted by undertakings that included a biodiversity footprint indicator

Biodiversity indicator expressed as MSA per square km or by square m (unspecified origin)	CRIS scores (using the CRIS method by Carbone4) broken down by climate hazard	CBF tool, Corporate Biodiversity Footprint (Iceberg Data Lab)	Cost of damage to the environment expressed as a % of revenue (S&P Trucost)	Global Biodiversity Score, MSA per square km (developed by CDC Biodiversité, score calculated jointly with EcoAct for Generali).	Derived from the Global diversity score	
					BIA-GBS™ tool (Biodiversity Impact Analytics) developed according to the Global Biodiversity Score (GBS) methodology of CDC Biodiversité; MSAppb* metrics expressed as MSA parts per billion (Carbon4 Finance)	Indicators derived from the GBS, MSA
APIVIA MACIF MUTUELLE BPCE VIE CNP Retraite CNP Assurances MUTAVIE SE AREAS group	MACSF EPARGNE RETRAITE MACSF PREVOYANCE	AXA ASSURANCES VIE MUTUELLE Groupama Gan Vie ACM Vie SAM	SMAVIE BTP - SOCIETE MUTUELLE D ASSURANCE SUR LA VIE DU BATIMENT ET DES TRAVAUX PUBLICS	AFI-ESCA Maif Vie GENERALI RETRAITE GENERALI VIE	ABEILLE EPARGNE RETRAITE ABEILLE VIE ABEILLE RETRAITE PROFESSIONNELLE ALLIANZ RETRAITE ALLIANZ VIE ANTARIUS SOGECAP SURAVENIR GENERATION VIE ORADEA VIE SOGECAP	SACRA (Limited company for the consolidation of insurance pensions)

3. Key insights from the biodiversity working group within the ACPR's Climate and Sustainable Finance Commission (CCFD)

In addition to the requirements arising from financial regulations, the ACPR also has a role to play in raising financial players' awareness of emerging risks. This awareness raising is carried out through working groups set up with the industry. On the topic of biodiversity, an initial working group was set up in 2022 with banks and insurance companies to identify best practices and initiatives undertaken by these financial players. This work continued in 2023 with the creation of a new working group under the aegis of the ACPR's Climate and Sustainable Finance Commission.

During working group meeting sessions, France Assureurs reviewed the main findings of its report on biodiversity (France Assureurs, 2021). The insurer trade association has undertaken a major effort to raise awareness among insurers and, against this background, has identified several impacts of biodiversity loss on the insurance sector, chiefly relating to regulating and supporting services:

- Deteriorating air quality (8 out of 10 city dwellers live in excessively polluted air, in France 48,000 deaths per year are caused by fine particle pollution) has an impact on chronic diseases and premature death rates;
- Reduced resistance to diseases, parasites and invasive species can lead to the emergence of new infectious diseases transmissible to humans (zoonoses) as well as to an increased risk of pandemic outbreaks; property damage leads to operating losses due to lockdowns and work stoppages caused by pandemics;
- The dwindling levels of insect pollination will have a impact on food due to insufficiently diversified diets;
- Water flow regulation imbalances can lead to an increase in the frequency, scale and costs of natural disasters as well as operating losses (business interruption or complete shut-down);

In terms of producing goods, access to water is a major concern according to France Assureurs: clean-up costs are significant (37% of the price of water is linked to its clean-up costs, according to FA) and one million French people do not have access to drinking water owing to a lack of resources.

As one of the participants involved in these working groups, the TNFD, relying on the World Economic Forum's Global Risk Report 2023, shared the observation that, when asked "Please estimate the likely impact (severity) of the following risks over a period of 2 and 10 years", the answer: "Incidents involving large-scale environmental damage" comes in 6th place over the 2-year horizon, and the answer "Biodiversity loss and ecosystem collapse" comes in 4th. The TNFD also recalls that 50% of global GDP is heavily or moderately dependent on nature according to the WEF (2018). The document published by the TNFD (Additional guidance for financial institutions) identifies metrics currently being developed by financial institutions in their disclosures. According to this inventory, it is clear that a very small number of private players (such as UBS, Aviva, ING, and BNP Asset Management) provide metrics. UBS built its dependency scores using the ENCORE database. Aviva calculates metrics that are specific to the risk of deforestation. ING provides a graph showing the size of its portfolio in four sectors, classified according to their dependence to and impact on biodiversity. According to its assessments, the mining sector carries the most significant diversity risk.

The metrics and approaches implemented by financial players to assess their respective biodiversity footprint reveal significant disparity. A classification of the key biodiversity risks to be monitored as a matter of priority has not yet resulted in stabilised stylised facts. Certainly, industries such as fertilizers and agrochemicals may be of particular interest to investors, as their activities are likely to be affected by new regulations. However, the materiality of this type of risk for the financial sector remains difficult to assess, and arbitrage within a portfolio is still an option should a sector with a consequential footprint be faced with an increased risk of default.

The diversity of approaches is not unexpected, given the nascent state of the inclusion of biodiversity as a full-fledged risk. Initiatives towards the building of a conceptual framework around biodiversity are recent. It was only in December 2023 that the NGFS proposed a conceptual framework for building biodiversity-related scenarios (cf. NGFS, 2023). Other private sector initiatives are also at an early stage, such as the Finance for Biodiversity Foundation, which published a charter for its members in January 2024.

The working group's efforts found that access to biodiversity-related data is crucial for the financial sector's quantitative assessment of its biodiversity footprint. When calculating the biodiversity footprint of their portfolio for the purposes of their annual report, BNP Asset Management (and the Banque de France) work with the data provider Iceberg Data Lab, which offers biodiversity footprints for around 4,000 issuers. Footprint calculations are based on a breakdown of each issuer by activity sector and country, which notably relies on the analysis of annual reports by an analyst. That footprint is divided into 4 footprints (expressed using the same unit of measurement, the MSA, mean species abundance): change in land use; water pollution; climate change; air pollution.

According to this type of database, two issuers presenting the same breakdown of revenues by business segment and country will therefore, theoretically, have very similar footprints. Distinguishing, among issuers, the most virtuous ones in terms of land use and water pollution proves especially challenging. Some issues remain unresolved as to the methodological choices to be made when calculating financial sector footprints: should the footprint ascribed to an issuer be that of its own activities, or that of its value chain (for instance, pesticide producers mostly harm biodiversity through the customers that buy their products)? What about securities issued by the financial sector and held by the financial sector? Since a significant share of financial sector assets is made up of securities issued by the financial sector, the footprint of one financial institution depends on the environmental policies of the other institutions. Therefore, the biodiversity footprint of sovereign bonds requires closer consideration.

The appropriateness of synthetic biodiversity metrics is open to debate. As has been repeatedly emphasised, biodiversity is multidimensional, and a single metric that converts various impacts -for example, land use and water pollution- into a single unit of measurement such as MSA.km2 can be difficult to capture when trying to establish links with to real-life phenomena. Moreover, such metric is not easily traceable to abatement costs. There is only a small number of quantitative studies available on the costs associated with an increase -by, say, 100 MSA- using alternative abatement technologies (reduced land use, air pollution control, etc.).

As biodiversity indicators can sometimes be difficult to interpret, it is questionable whether the choice made by the regulatory authority to encourage and request their calculation is appropriate. When questioned on this issue, members of the CCFD working group on biodiversity stated that, despite all the limitations and caveats surrounding these indicators, footprint metrics provide them with a fruitful quantitative framework insofar as it prompts them to gain a better understanding of the composition of their portfolio, to reflect on its interactions with biodiversity in its various dimensions (provision of assets, regulation of systems, etc.) and to ask themselves the right questions regarding the materiality and scale of issues at stake.

The link between biodiversity footprints and the associated transition risk forms another remaining analytical challenge.

To be sure, a financial player with a significant share of securities issued by companies with a consequential biodiversity footprint may theoretically have be concerned that such companies could face higher costs in the future (for instance, if agriculture needs to become less pesticide-intensive and more labour-intensive), or stricter regulations (for example, in the fertilizer production sector). However, the methodological choices required to link footprint and risk are complex, as evidenced by their being tackled in dedicated work programmes. When building biodiversity scenarios or even dedicated stress tests for biodiversity, two avenues appear, prima facie, worth considering: an “MSA price” approach that would consist in considering that polluters internalise the cost of their footprint and thus incur reduced profitability; a regulatory shock approach where a tightening environmental standards would be implemented in certain sectors.

A few recommendations for insurers based on the 2022 and 2023 29LEC reports

Based on the findings of the 29LEC reports submitted in 2022 and 2023, a number of recommendations can be made on the topic of biodiversity.

Overall, undertakings' efforts should focus on providing clear, accurate and documented information. The general considerations on biodiversity that were included in a number of reports, are not such sufficient to meet the requirements laid down by Article 29LEC and the SFDR.

Moreover, 29LEC reports should clearly indicate that involvement in activities associated with a positive impact on biodiversity is not in itself enough to offset the negative pressures exerted by other activities. Efforts must also be made to reduce these adverse pressures.

We can thus highlight three main steps in order to meet the requirements of article 29LEC in its biodiversity section:

1) Risk assessment

The transition from exposure measurement to risk measurement is highly complex, but here again, the use of methods already available can enable organizations to identify, by sector of activity for a set of indicators (pressures, state of nature, etc.), the pressure factors most relevant to the insurer.

2) Governance and compliance with CBD objectives

Insurers could present their strategy for alignment with long-term biodiversity objectives in greater detail, by applying the following recommendations:
- provide quantified information ;
- provide a description of the methodologies and indicators employed, a definition of the terms used, and indicate the databases or service providers used;
- present the internal resources deployed to meet these objectives, particularly in terms of governance.

This involves active participation in initiatives such as those listed in this report, as well as the setting of quantified objectives and resources (footprint measurement, impact analysis, dialogue, etc.) as a first step.

3) Analysis of main pressures and impacts

Although data is lacking and methods are not yet fully established, the analysis carried out in this report shows that it is possible to use one of the aggregated biodiversity footprint indicators to provide an initial measure, which is already done by a majority of organizations (55% of insurers surveyed). At this stage, it is also important to ensure transparency with regard to the measurement of the biodiversity footprint:
- Include the names of the indicators, metrics and methodologies used, as well as the identity of the service providers producing these metrics, where applicable;
- specify the part of the portfolio included in the footprint measurement.

In addition, insurers could present their strategy for alignment with long-term biodiversity targets in greater detail, by implementing the following recommendations:

- provide quantitative information;
- provide a description of the methods and indicators used, a definition of the terms used, and add references to the databases or service providers used;
- include an overview of in-house resources mobilised to align with these targets, especially in terms of governance.

Insurers may also refer to the recent publication of a methodological guide issued by the Office of the Commissioner-General for Sustainable Development (CGDD) and ADEME (2024) to help them design their approach to biodiversity.

Insurers are also required to implement the Corporate Sustainability Reporting Directive (CSRD) starting this year, with a view to submitting their first report in 2025. One of the primary goals of this directive is to standardise the extra-financial reporting of financial and non-financial institutions with more than 250 employees and more than EUR 40 million in revenue, notably as a way to promote transparency and enhance comparability. The CSRD will be broken down into 12 standards covering sustainable development issues as part of the mechanism designed implementing the directive: the ESRS (sustainability reporting standards) developed by EFRAG[29]. Five of these 12 standards relate to the environmental dimension and are explicitly aligned with the European Green Taxonomy.

They address climate change, pollution, water and marine resources, biodiversity and ecosystems and the circular economy.

The ESRS E4 standard specifies corporate reporting requirements concerning biodiversity. It notably offers various tools and methods the use of which is recommended.

Among the 6 focus areas[30] highlighted in this standard, most of which are already covered in Article 29LEC, two of them are especially important for risk assessment and monitoring: E4-1 on biodiversity and ecosystem transition plans; E4-6 on the potential financial effects of impacts, risks and opportunities related to biodiversity and ecosystems. Pursuant to the first focus area, insurers will be required to determine the compatibility of their transition plan, and especially that of the prudential transition plan that should be integrated into the Solvency II Regulation, taking into account scientific knowledge related to both the local ecological context and the national and global one. Under this framework, insurers will also be required to conduct a double materiality analysis.

Pursuant to the second focus area, insurers will also be required to submit an assessment of the potential financial effects of significant risks and opportunities arising from impacts on, and dependencies on, biodiversity and ecosystems. In this context, they will endeavour to quantify, in monetary terms when possible, the potential financial effects of the materialisation of risks associated with biodiversity loss. Failing that, insurers will be required to provide a qualitative analysis.

A considerable amount of work remains to be done, however, as a significant gap remains between the notions of dependency and impact, which are essentially exposure measures, and that of risk, which all undertakings must ultimately manage and some must insure against. It is therefore crucial to further reflect on, and invest in, the identification, assessment and prevention of the financial and non-financial risks related to biodiversity loss.

[29] Cf. EFRAG (2022).

[30] 1/ Transition plan on biodiversity and ecosystems; 2/ Biodiversity and ecosystem policies; 3/ Actions and resources related to biodiversity and ecosystems; 4/ Targets related to biodiversity and ecosystem; 5/ Impact metrics related to biodiversity and ecosystems change; 6/ Potential financial effects from biodiversity and ecosystem-related impacts, risks and opportunities related to biodiversity and ecosystems.

CONCLUSION

As evidenced by the review of the 29LEC reports published in 2022 and 2023, some effort have been made, but significant progress remains needed on the part of insurers, with a view to better include (i) the impact and pressures exerted by their activities on biodiversity, and (ii) the risks arising from the biodiversity dependencies of their assets and the activities in which they invest. These improvements are all the more anticipated and necessary given that insurance undertakings are especially concerned by the risks arising from the decline in biodiversity, as a result of their claim-settlement activities on the liabilities side. Yet, the sheer complexity of issues relating to the repercussions of biodiversity loss makes it difficult to build reliable, concise and harmonised indicators allowing for the quantification of these impacts and dependencies. The most mature insurers could, however, already initiate an analysis of very specific pressures (deforestation or physical risks linked to water, for example), on a limited portfolio of assets and using specialized databases.

Recent initiatives spearheaded by the TNFD, the NGFS and other authorities should alleviate a number of these constraints, especially by way of (i) the implementation of a commonly recognised conceptual framework along with unanimously accepted definitions and (ii) the building of scenarios for nature-related risks.

Supervisors, including the ACPR, will continue to study tools that could be used to better assess the financial consequences of biodiversity loss and improve the way this risk is taken into account.

APPENDIX 1: INFORMATION REQUIRED UNDER ARTICLE 29 LEC CONCERNING THE ALIGNMENT STRATEGY WITH LONG TERME BIODIVERSITY OBJECTIVES

Information related to the strategy for alignment with long-term biodiversity objectives, as required under Article 29 LEC		
Type of information	Category content	nature of the information required
1st category of information required - Assessment of compliance with the objectives set out in the Convention on Biological Diversity adopted in 1992, divided into 7 items of information, 3 of which with a regulatory nature and 4 of which being recommendations issued by the ACPR	1. Integration of compliance with the Convention on Biological Diversity (1992) into the organization's objectives. *The objectives are: (i) to conserve biological diversity; (ii) to sustainably use biological diversity; (iii) to fairly and equitably share the benefits arising from genetic resources*	Regulatory
	2. Establishment of quantified targets by 2030 to meet the requirements of the Convention	Regulatory
	3. Indication of the scope of these objectives	Regulatory
	4. Participation in initiatives (working group, alliances, research and development, etc.) to achieve the objectives of the Convention on Biological Diversity adopted in 1992	ACPR recommendation
	5. Description of the contribution and actual actions made as a result of these initiatives	ACPR recommendation
	6. Taking measures to limit the impact of the investment strategy on biodiversity	ACPR recommendation
	7. Establishment of concrete sectoral limits to meet the requirements of the Convention	ACPR recommendation
2nd category of information required - Analysis of contribution to reducing the main pressures and impacts on biodiversity defined by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, divided into 2 pieces of information, one of which is of a regulatory nature and the other a recommendation by the ACPR	8. Ability to analyze key biodiversity pressures and impacts of the investment portfolio on biodiversity	Regulatory
	9. Measuring the potential positive and/or negative impact of changes in ecosystems and biodiversity on investment	ACPR recommendation
3rd category of information required - mention of the support on a biodiversity footprint indicator and, where applicable, the way in which this indicator makes it possible to measure compliance with the international biodiversity targets, divided into 3 pieces of information of a regulatory nature	10. Production of a biodiversity footprint indicator to measure the impact of the investment portfolio on biodiversity	Regulatory
	11. Description of how this indicator measures compliance with biodiversity targets	Regulatory
	12. Where such an indicator is not available, methods are being developed to measure the impact of activity on biodiversity	Regulatory

APPENDIX 2: TOOLS USED TO CALCULATE RISKS RESULTING FROM BIODIVERSITY LOSS

Box: Tools used in biodiversity loss risk calculations

This box introduces the main tools and concepts used to calculate biodiversity risks. As these risks are multifaceted, reducing them to a common metric proves useful for companies and insurers. The unit of measurement used for this metric is the same across the various dimensions considered, so that they can be aggregated and to build total footprints and dependencies. The most common unit of measurement is the Mean Species Abundance index. In terms of quantification, footprint and dependencies are initially assessed at sectoral level and according to production processes. The ENCORE and EXIOBASE databases are often used at this stage. Through an analysis of the sectoral composition of a given undertaking's business, as detailed in its business reports, data providers are able to offer assessments of footprint and dependencies at the level of the company or at that of the security it issues.

1. A common unit of measurement: Mean Species Abundance (MSA).km2

This relatively abstract measure makes it possible to translate biodiversity losses with different origins (water pollution, land use, etc.) into the same unit of measurement, and therefore to calculate aggregate footprints.

Developed by the Netherlands Environmental Assessment Agency (PBL) and based on the GLOBIO model, it relies on the carbon dioxide equivalent in metric tonnes method in order to generate a concise measure of impact on biodiversity. It **varies** between 0 (all original species are extinct) and 1 (they are intact).

According to the Biodiversity Research Foundation, the GLOBIO model has limitations. Indeed, the pressure-impact relationships used in this model is allegedly biased in favour of the most studied species and ecosystems. In addition, these relationships are allegedly based on correlation rather than causation. It would also appear that dependencies between spacial units are not taken into account. This would imply that spatial autocorrelation, and therefore phenomena such as dispersion and connectivity, would not be factored in either, which would skew impact assessments. Finally, given the selected method, the MSA index generates a potential state of biodiversity, rather than an actual state[31].

2. An alternative unit of measurement option: Species threat abatement and restoration metrics (STAR)

The Species Threat Abatement and Restoration metrics (STAR) is an analytical metric developed by IBAT[32] teams and primarily aimed at the finance industry. It allows for the quantification of the potential contribution activities or investments can make to reducing the risk of species extinction, by way of threat abatement and habitat restoration.

STAR is calculated using data on the distribution, threats to and extinction risk of species included on the IUCN Red List of Threatened Species. These data are backed by IBAT tools and form a global map of extinction risk scores, mapped into 5km2 squares, with each square indicating the contribution of each threat to the score.

This method makes it possible to link activities and pressures with pressures and impacts (pressure-state-response model).

[31] "Metrics and measurement tools Assessing the impact of human activities on biodiversity?" French Foundation for Biodiversity Research (FRB) 2021, page 39.

[32] IBAT is a subscription service that offers free access to biodiversity maps, as well as premium priced value-added services such as reports, raw data downloads and web services. This platform was developed and is maintained by the IBAT Alliance: Bird Life International, Conservation International, IUCN and the UN World Conservation Monitoring Centre.

The limitations of this approach are due to the limited access to data on protected areas and key biodiversity areas. Furthermore, STAR does not include information on threats to habitats. Such information is not yet available on a global scale like species data is.

3. **The assessment of dependencies according to production processes: the "Exploring natural capital opportunities, risks and exposure" (ENCORE) database**

The Exploring Natural Capital Opportunities, Risks and Exposure database was developed by the Natural Capital Finance Alliance[33], jointly with the United Nations' World Conservation Monitoring Centre (UNEP-WCMC). It can be used to describe the level of dependency of 86 production processes on 21 ecosystem services. That level varies, on a scale from "very low" to "very high". This generates scores, ranging from 0% (no dependency) to 100% (extreme dependency). This tool is used by several entities subject to the requirements set by Article 29 of the French energy and climate Law.

Of course, the information contained in the ENCORE database relates, by design, to present-day industrial technologies and standards, and it does not take into account future developments in industries aimed at reducing dependencies.

4. **Assessing impacts according to sectoral composition and geographical area: the EXIOBASE database**

EXIOBASE is a database developed by a consortium of research institutes and funded by a European research program. It is an open access database containing multiregional supply-use and input-output tables, to which the environmental effects of activities are linked.

5. **A data provider for company-specific data: CDC Biodiversité and Carbon 4's Global Biodiversity Score (GBS)**

This indicator, which was developed by the CDC Biodiversité and implemented in database form by Carbon4Finance, is based on life-cycle assessment and makes it possible to draw links between human activities and pressures (using the EXIOBASE database) and between pressures and impacts (using the GLOBIO model).

The GBS combines the revenue of a company, according to geographical area and production sector, the pressures exerted by that company's activities on biodiversity, and then derived from such information impacts expressed in a single metric, the MSA.km² (derived from the MSA index described above)

This approach is supplemented by the Biodiversity Impact Analysis (BIA) database, which captures the impact of financial institutions on biodiversity, allowing them to calculate the biodiversity impacts associated with their underlying assets. It assesses the effects of these assets on biodiversity by combining financial data and the greenhouse gas emissions data taken from Carbon4 Finance.

Several criticisms can be levelled against this indicator: (i) as this approach is based on averages, it provides an estimate of a potential footprint rather than the actual biodiversity footprint of a given activity or portfolio; (ii) with the exception of climate change data, pressures and emissions data are based on sectoral averages and, therefore, are not company-specific; (iii) GLOBIO biases towards the most studied species and ecosystems also apply to this approach; (iv) lastly, a number of aspects are either not covered by this indicator, or only partially so, such as impacts on marine biodiversity, invasive species, soil degradation or overexploitation.

Another version of the GBS tailored to financial institutions was developed by CDC Biodiversité: the GBS for financial institutions (GBSFI). The methodological foundations of the GBS and GBSFI are

[33] A financial sector initiative that provides financial institutions with expertise, information and tools on the material aspects of natural capital.

identical, but their respective operational framework differs: the GBSFI covers multiple financial assets and allows for the calculation of portfolio footprints.

6. **A data provider for company-specific data: Corporate Biodiversity Footprint (CBF) from Iceberg Data Lab**

The Corporate Biodiversity Footprint (CBF) is an indicator developed by the consultancy firm Iceberg Data Lab for financial companies. The CBF is based on a life cycle assessment approach and uses the MSA metric (results are expressed in Km² MSA). For each activity, it makes it possible to study the pressures exerted on biodiversity, and associates to them the related pressure-impact relationships.

The four pressures identified are land use, climate change, water pollution and air pollution, and the estimated impact is generated as the annual impact of the activity considered on biodiversity.

The analysis is conducted in three steps: 1) the financial and operational parameters of the company concerned are collected; (2) these parameters are then used to estimate company-specific environmental pressures (GHG and NOx emissions, land use footprint, volume of toxic compounds released); (3) the pressures are translated into impacts and converted into the km2.MSA unit. The impact of all pressures is then aggregated to form the company's global biodiversity footprint. According to this indicator, the impact on biodiversity can be positive or negative.

7. **Biodiversity footprint for financial institutions (BFFI)**

This indicator, which was developed by the consulting firms Pré and CREM and ASN Bank, jointly with the Netherlands Enterprise Agency (RVO), aims to provide the biodiversity footprint of economic activities financed by financial institutions. This approach allows for the calculation of the environmental pressures and biodiversity impact of investments included in a given portfolio, or at the level of a whole portfolio, asset class, firm or project.

This impact is expressed as a fraction of potentially extinct species per year on one hectare (PDF.ha.yr) or one square meter (PDF.m².yr), for each step in the value chain. Another metric used illustrates biodiversity loss relative to each euro of revenue (m²/€).

This indicator, which has been available since 2014, is based on the ReCiPe pressure-impact relationship analysis model, and uses environmental data from Life Cycle Assessment (LCA) databases such as EXIOBASE or equivalents.

The methodology used to calculate this indicator consists of four steps: (1) design of the analytical framework (definition of the undertaking's activities and selection of the activities included in the scope of assessment), (2) assessment of the environmental impact of the undertaking's economic activities or of the projects in which the financial institution invests, (3) assessment of the environmental pressures and impacts on biodiversity using the ReCiPe model (pressure-response assessment), (4) analysis and interpretation of the results and definition of potential steps to be taken.

Being based on sectoral averages -notably through the use of the EXIOBASE database- this approach must, yet again, be taken as an estimate of potential impacts on biodiversity. The limited granularity level of the indicator restricts its applicability to specifically forecast the impact of a future project. However, this limitation is admissible when the indicator is used at portfolio level to identify areas of concern in terms of impact on biodiversity. Furthermore, the approach is biased towards the more temperate areas in terms of land-use impacts, therefore making it less accurate for tropical regions. Finally, the ReCiPe model does not cover all biodiversity loss factors: the introduction of alien invasive species is not yet covered, and overexploitation is only partially covered to date.

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