

CONSULTATION
PAPER

CONSULTATION PAPER

on a Report on Biodiversity Risk Management
by Insurers

EIOPA-BoS-24-455



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European Insurance and
Occupational Pensions Authority

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RESPONDING TO THIS PAPER

EIOPA welcomes comments on the Consultation paper on a Report on Biodiversity Risk Management by Insurers.

Comments are most helpful if they:

- ▶ respond to the question stated, where applicable;
- ▶ contain a clear rationale; and
- ▶ describe any alternatives EIOPA should consider.

Please provide your comments to EIOPA via EU Survey ([link](#)) by 26 February 2025 23:59 CET.

Contributions not provided via EU Survey or after the deadline will not be processed. In case you have any questions please contact Solvencyllreview@eiopa.europa.eu.

Publication of responses

Your responses will be published on the EIOPA website unless: you request to treat them confidential, or they are unlawful, or they would infringe the rights of any third party. Please, indicate clearly and prominently in your submission any part you do not wish to be publicly disclosed. EIOPA may also publish a summary of the survey input received on its website.

Please note that EIOPA is subject to Regulation (EC) No 1049/2001 regarding public access to documents and EIOPA's rules on public access to documents.¹

Declaration by the contributor

By sending your contribution to EIOPA you consent to publication of all non-confidential information in your contribution, in whole/in part – as indicated in your responses, including to the publication of the name of your organisation, and you thereby declare that nothing within your response is unlawful or would infringe the rights of any third party in a manner that would prevent the publication.

Data protection

Please note that personal contact details (such as name of individuals, email addresses and phone numbers) will not be published. EIOPA, as a European Authority, will process any personal data in line with Regulation (EU) 2018/1725. More information on how personal data are treated can be found in the privacy statement at the end of this material.

Next steps

¹ [Public Access to Documents](#).

EIOPA will revise the proposal in view of the stakeholder comments received. EIOPA will publish a report on the consultation including the revised proposal and the resolution of stakeholder comments.

1. BACKGROUND AND RATIONALE

1. If unmitigated, biodiversity loss can result in significant economic risks, potentially jeopardising financial stability.
2. The NGFS notes that “biodiversity loss and nature-related risks could have significant macroeconomic and financial implications”, and the failure to address these risks is “a source of risks relevant for financial stability.”² Loss of biodiversity and collapse of ecosystems are among the top 3 most severe risks over the long term (10 years).³
3. More than half of global gross domestic product (GDP) would be dependent on nature and its services.⁴ Water-related risks are dominant and could constitute 7 – 9% of global GDP, with significant impacts on the manufacturing sector. Risks to agriculture are also significant, estimated at around 14 – 18% of output at risk from water-related risks and potentially 12% of output at risk related to pollinator decline.⁵
4. According to the OECD, the world lost an estimated USD 4-20 trillion per year in ecosystem services from 1997 to 2011, owing to land-cover change and an estimated USD 6-11 trillion per year from land degradation.⁶ If no mitigating measures are taken (‘business as usual’), the loss of ecosystem services could lead to an annual loss of US\$ 479 billion. Over the period between 2011 and 2050, the total cumulative loss would be US\$ 9.87 trillion.⁷
5. Other estimates have been made to suggest that biodiversity loss and ecosystem degradation could lead to annual economic losses ranging from €1.7 trillion to €3.9 trillion.⁸
6. Studies on the exposure of the financial sector (incl. the insurance sector) show that between 36-42% of their investments are in economic activities dependent on biodiversity or nature.⁹

² NGFS (2022). Statement on Nature-Related Financial Risks.

³ World Economic Forum (2024). The Global Risks Report 2024.

⁴ World Economic Forum (2020). Nature Risk Rising, Why the Crisis Engulfing Nature Matters for Business and the Economy.

⁵ Ranger, N., et al. (2023): The Green Scorpion: the Macro-Criticality of Nature for Finance – Foundations for scenario-based analysis of complex and cascading physical nature-related risks.

⁶ OECD (2019) Biodiversity: Finance and the Economic Case for Action.

⁷ WWF (2020). Global Futures, Assessing the global economic impacts of environmental change to support policy-making.

⁸ DNB Biodiversity Working Group (dnb.nl). Or also: World World Economic Forum (2010). Biodiversity and business risk, A global risks network briefing. The report refers to The Economics of Ecosystems and Biodiversity (TEEB), Cost of Policy Inaction Report, 2008. \$2 - \$4.5 trillion is the present value of net ecosystem service losses from land-based ecosystems (e.g. forests, tundra, cultivated land) caused in 2008 and continuing for 50 years, based on discount rates ranging from 1 – 4%.

⁹ DNB (2020). Indebted to nature – Exploring biodiversity risks for the Dutch financial sector. Banque de France (2021). Working Paper, A “Silent Spring” for the Financial System? Exploring Biodiversity-Related Financial Risks in France.

7. EIOPA has identified that approximately 30% of insurers' corporate bond and equity exposures are highly and directly dependent on at least one ecosystem service (e.g., water resources. See Annex).¹⁰

1.1 MANDATE TO EIOPA FOR A REPORT ON BIODIVERSITY LOSS RISK IN THE ORSA

8. Considering these economic and financial impacts and dependencies on biodiversity, the amended Solvency II Directive includes a mandate for EIOPA to assess (re)insurance undertakings' current own risk and solvency (ORSA) practices and identify necessary actions for undertakings to adequately consider biodiversity loss risks.

Article 304(c)3) of Directive 2009/138/EC¹¹ (Solvency II Directive) mandates EIOPA to [...] *evaluate whether and to what extent insurance and reinsurance undertakings assess their material exposure to risk related to biodiversity loss as part of the assessment referred to in Article 45(1). EIOPA shall subsequently assess which actions should be taken to ensure that insurance and reinsurance undertakings duly consider these risks. EIOPA shall submit a report with its findings to the Commission by 30 June 2025.*

1.2 APPROACH TO THE MANDATE

9. **Regulatory efficiency.** The analysis of biodiversity risk forms part of the Solvency II requirement to identify, assess, manage and monitor sustainability risks. The approach to the analysis and any actions therefore fit into the overall framework, and should be consistent, not duplicate requirements and not impose unnecessary additional burden to undertakings. For this purpose, the report analyses market practices and potential actions, building on
- (a) Existing regulatory requirements on ORSA and the identification and management of sustainability risks in the Solvency II Directive and Delegated Regulation.
 - (b) Differences and similarities with the treatment of other sustainability risks, including climate change and social risks, to the extent relevant.
 - (c) Work in progress to structure and consolidate the approach for the management of sustainability risks into 'sustainability risk plans', as per Article 44 of the amended Solvency II Directive.
 - (d) The report builds on the earlier EIOPA Staff Paper on Nature-Related Risks.¹²
10. **Proportionality.** Biodiversity loss risk is a multifaceted risk, which is intertwined with climate change risk, and can have broad impacts on economic and financial development. The

¹⁰ EIOPA (2023). Financial Stability Report June.

¹¹ Directive 2009/138/EC of the European Parliament and of the Council of 25 November 2009 on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II), [corrigendum of the text of the provisional agreement as adopted by the European Parliament on 23 April 2024](#). (Solvency II Directive).

¹² EIOPA (2023b). Staff paper on nature-related risks and impacts for insurance.

measurement of the risk is not straightforward, and while datapoints on, for example, the evolution species or habitats are available, these are not easily implemented for financial decision-making purposes by insurers. For these reasons, for the integration of biodiversity risk assessment in insurers' risk management, one should acknowledge the current limitations in data and methodologies and enable qualitative and high-level financial risk assessments. Integrating biodiversity risk analysis into the ORSA for small and non-complex undertakings is likely to be a complex, resource-intensive and disproportionate exercise, given the uncertainties regarding the data and lack of appropriate assessment methodologies. The more important the risk is for the undertaking however, the more in-depth the assessment should be.

11. **Cross-sectoral consistency and international developments.** The analysis considers earlier and ongoing work by international institutions and financial market players to address biodiversity and nature-related risks. These include:
 - NGFS: Nature-related Financial Risks – a Conceptual Framework to guide Action by Central Banks and Supervisors¹³
 - OECD: A supervisory framework for assessing nature-related financial risks¹⁴
 - TNFD: Recommendations of the Taskforce on Nature-related Financial Disclosures¹⁵ which sets out the LEAP approach to locate, evaluate, assess and prepare (to respond and report) on nature-related risks and opportunities.
 - European Commission (COM): Study for a methodological framework and assessment of potential financial risks associated with biodiversity loss and ecosystem degradation¹⁶
12. Though none of these frameworks so far assesses insurance-specific risks in detail, they help in structuring the basis for analysis, identifying risk drivers and transmission channels, including exposures in the real economy based on impacts and dependencies on ecosystem services. The frameworks provide guidance on conducting high-level exposure and materiality assessments, offer potential narratives for scenario analysis and present several metrics for financial risk assessment.¹⁷
13. **Evidence-based.** EIOPA launched a questionnaire for supervisors to collect market input on the current integration of biodiversity and nature loss risk in undertakings' ORSAs. This questionnaire formed part of a broader exercise to inform the monitoring of the application of the Opinion on the supervision of the use of Climate Change Scenarios in the ORSA, which ran from April to November 2024. In addition, EIOPA conducted a stakeholder outreach in June 2024 to gather

¹³ NGFS (2023a). Nature-related Financial Risks: a Conceptual Framework to guide Action by Central Banks and Supervisors.

¹⁴ OECD (2023). A supervisory framework for assessing nature-related financial risks: Identifying and navigating biodiversity risks.

¹⁵ TNFD (2023c). Recommendations of the Taskforce on Nature-related Financial Disclosures.

¹⁶ European Commission (2024). Directorate-General for Financial Stability, Financial Services and Capital Markets Union, Cziesielski, M., Dekker-Hufler, C., Pal, T., Nicholls, G. et al., Study for a methodological framework and assessment of potential financial risks associated with biodiversity loss and ecosystem degradation – Final report.

¹⁷ TNFD (2024). Additional guidance for financial institutions version 2.0.

evidence on industry experiences and practices related to integrating biodiversity loss risk assessments into their ORSA.¹⁸ The consultation aims at collecting further market practices.

¹⁸ EIOPA (2024). [Stakeholder engagement on biodiversity loss risk for insurers - EIOPA \(europa.eu\)](#).

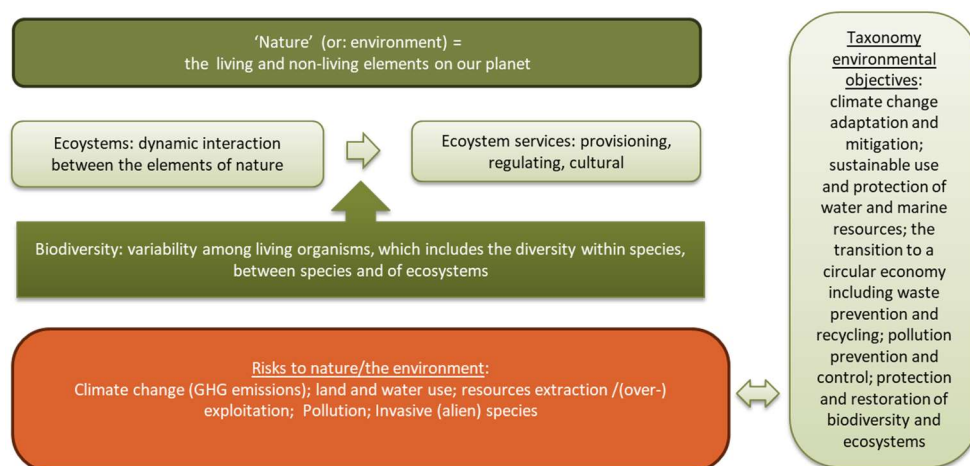
2. DEFINING BIODIVERSITY AND RISK DRIVERS FOR INSURERS

2.1 DEFINITION OF BIODIVERSITY RISK

Biodiversity, nature and climate

14. Biodiversity is often referred to interchangeably with “nature” and biodiversity risk is intertwined with climate change risk. This calls for a consistent approach across the treatment of sustainability risks, and at the same time, makes the separate identification of biodiversity risk for prudential risk assessment purposes difficult.
15. Firstly, biodiversity is inextricably linked to the state of nature. Nature encompasses all biotic and abiotic elements on Earth, and provides a continuous flow of benefits to people, often referred to as ecosystem services. These eco-system services are categorised as follows:
 - Provisioning services: provisioning of raw materials, such as food and water, shelter, energy and other resources,
 - Regulating & maintenance and supporting services: regulation of climate and natural processes, pollination, filtering of waste, purifying and maintenance of natural resources,
 - Cultural services: non-materialistic goods and services (‘spiritual and recreational benefits’), such as green spaces, as well as land and seascapes that allow for leisure and tourism-related activities.
16. Biodiversity¹⁹ ensures the ongoing provision of these ecosystem services, which many industries heavily rely on or directly impact on. Consequently, biodiversity loss poses a multidimensional risk for insurers, potentially affecting, among other things, the value of investments held or the intensity and frequency of insured losses.

Figure 1: interrelation of nature, ecosystems, biodiversity and risks to nature. Based on IBPES key drivers of biodiversity loss



¹⁹ Defined as the ‘variability among living organisms from all sources, including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.’ See Convention on Biological Diversity (1992), Article 2.

17. Reference to frameworks to assess the complexity of defining biodiversity risk, are shown in Table 1.

Box1: Definitions of biodiversity risk.

The **Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)** uses the terms "biodiversity loss" and "nature's degradation" to describe the decline in biodiversity and the degradation of ecosystem services. These risks are driven by changes in sea and land use, overexploitation of organisms, pollution, invasive alien species, and climate change.²⁰ (further referred to as 'IPBES risk drivers')

The **EU Taxonomy Regulation 2020/852** defines environmental objectives in relation to these IPBES pressure points. The objectives include the sustainable use and protection of water and marine resources, transitioning to a circular economy (including waste prevention and recycling), pollution prevention and control, protecting and restoring biodiversity and ecosystems, and climate change adaptation and mitigation.

The **EU Delegated Regulation 2023/2486** sets out technical screening criteria and defines activities contributing to the protection and restoration of biodiversity and ecosystems as activities aimed at maintaining or improving the status and trends of terrestrial, freshwater and marine habitats, ecosystems and populations of related fauna and flora species. The activities should also not harm climate change mitigation purposes and comply with criteria set out for climate change adaptation, sustainable use and protection of water and marine resources, and pollution prevention and control.²¹

The **NGFS "Nature-related Financial Risks: Conceptual Framework to guide Action by Central Banks and Supervisors"**²² does not separately define biodiversity risk, and refers to biodiversity and nature, adopting an integrated approach which also considers climate-related financial risks within the scope of nature-related financial risks.

The **Taskforce on Nature-related Financial Disclosures (TNFD)** defines nature loss as loss and/or decline of the state of nature, including but not limited to, the reduction of any aspect of biological diversity, such as diversity at the genetic, species and ecosystem levels in a

²⁰ IPBES (2019). Global Assessment Report on Biodiversity and Ecosystem Services.

²¹ European Commission (2023a). Commission Delegated Regulation (EU) 2023/2486 of 27 June 2023 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to the sustainable use and protection of water and marine resources, to the transition to a circular economy, to pollution prevention and control, or to the protection and restoration of biodiversity and ecosystems and for determining whether that economic activity causes no significant harm to any of the other environmental objectives and amending Commission Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities.

²² NGFS (2023a).

particular area through death (including extinction), destruction or manual removal. The report continues with identifying nature-related (physical and transition) risks as potential threats (effects of uncertainty) posed to an organisation that arise from its and wider society's dependencies and impacts on nature.²³

The **European Sustainability Reporting Standards (ESRS)** define biodiversity-related risks as risks that may have a material impact on an undertaking's value arising from its impact on biodiversity and ecosystems, including but not limited to:

- Risks related to the undertaking's impact on species, ecosystems, and habitats.
- Risks related to the undertaking's dependence on ecosystem services.
- Risks related to the undertaking's impact on natural resources, including water and land.

The work of these institutions shows a common understanding of the drivers of these risks:

- Physical risks: risks to an organization's operations or assets resulting from the degradation or loss of nature and biodiversity (e.g., loss of ecosystem services, changes in species composition, or extinction).
- Transition risks: risks to an organisation's business model or profitability resulting from the transition to a nature-positive economy (e.g., changes in regulations, stakeholder expectations, or market preferences).
- Legal or other operational risks: potential costs or liabilities arising from an organisation's impact on biodiversity (e.g., fines, litigation, or reputational damage).

18. As reflected in several definitions, climate change is a significant driver of biodiversity loss and could become the most important driver of biodiversity loss by mid-century.²⁴ Biodiversity loss can, in turn, exacerbate the effects of climate change.²⁵ This is known as the 'climate-nature nexus', which poses difficulties to the separate identification of biodiversity risk, and its risk to economic activities, in addition or separately from climate risk. As a result of this nexus, it is difficult to distinguish biodiversity loss risk from climate change related risk, especially when accounting for the impact of natural catastrophe losses.²⁶
19. For example, the loss of biodiversity and depletion of ecosystems (e.g. degradation of coral reefs or wetlands) can lead to increased losses from natural catastrophes in property insurance lines of business, including increasing claims for business interruption insurance. Also, forests with a rich

²³ TNFD (2023c).

²⁴ For instance, the absorption of excess carbon dioxide by oceans has increased both their temperature and acidity, making it difficult for marine species such as shellfish to form their calcium shells. As a result, many species at the base of marine food chains are disappearing, which negatively impacts the growth and distribution of fish stocks higher up the food chain. See also: Henrique M. Pereira *et al.*, Global trends and scenarios for terrestrial biodiversity and ecosystem services from 1900 to 2050. *Science* **384**,458-465(2024). DOI:[10.1126/science.adn3441](https://doi.org/10.1126/science.adn3441).

²⁵ For example, the destruction of marine life reduces the oceans' capacity to sequester CO₂ from the atmosphere (i.e. degrading carbon storage), thereby accelerating global warming.

²⁶ [Biodiversity loss and climate extremes — study the feedbacks \(nature.com\)](https://www.nature.com/articles/d41586-023-00000-0).

diversity of vegetation can create natural fire breaks, slowing down the spread of wildfires and reforestation can help mitigate climate change risks. Natural catastrophes can lead to the (further) destruction or depletion of natural resources.

20. The question arises whether it is relevant to identify separately the biodiversity risk, or address the risk more holistically, as natural catastrophes are impacted by biodiversity loss and climate change, and vice versa, and both have mutually reinforcing impacts, as shown in the following paragraph.
21. Climate mitigation and adaptation measures can support biodiversity conservation or targets but can also have undesirable effects on biodiversity. These can include:
 - Land-use change pressure from renewable energy installations such as wind farms or solar power plants, or from biofuel farming.
 - Ecosystem disruption due to mining of minerals necessary for batteries and sustainable technologies, the planting of monocultures to capture CO₂, or dam infrastructure for clean energy purposes.
22. Thirdly, the integration of biodiversity risks should aim to be consistent with the approach for other sustainability risks in Solvency II, which includes other environmental risks, such as climate change, as well as social risks and governance risks. Their integration into the prudential framework for Pillar I and II requirements is at varying stages of development, with a focus primarily on climate change risks to date.
 - **Climate:** Legal requirements mandate scenario analysis for material risks (amended SII Directive, art. 45), supported by EIOPA's application guidance²⁷. EIOPA conducted an analysis of the risk profile for fossil-fuel related stocks and bonds and found evidence which could support a differentiated treatment (EIOPA's Report on the Prudential Treatment²⁸ of sustainability risks for insurers). EIOPA is also monitoring the application of the EIOPA Opinion on climate change scenarios.
 - **Social:** EIOPA's Report on the Prudential Treatment²⁹ of sustainability risks for insurers indicates potential for development of Pillar II requirements for qualitative materiality risk assessment as part of ORSA. No advice has been provided on a dedicated Pillar I prudential treatment. Social risks and objectives can also be addressed through product oversight and governance, ensuring fair treatment.
23. While there are similarities with the integration of climate or social risks in ORSA, there are also important differences that must be considered. This requires recognising both the commonalities as well as specificities of biodiversity loss risk, where applicable. For instance, biodiversity loss risks are local in nature and often inter-related with climate risks. The latter may call for 'integrated' climate-nature approaches for scenario analysis or risk mitigation purposes, or on the contrary, for separate risk identification to avoid overlaps.

²⁷ EIOPA (2022). Application guidance on climate change materiality assessments and climate change scenarios in ORSA.

²⁸ [Final Report on the Prudential Treatment of Sustainability Risks for Insurers - EIOPA](#)

²⁹ [Final Report on the Prudential Treatment of Sustainability Risks for Insurers - EIOPA](#)

Box 2: similarities and differences between biodiversity risk, and climate and social riskComparison Climate-Biodiversity³⁰

Similar: both are ‘environmental risks’, which can transmit via physical and transition risks, over short and medium-to-long-term horizon. Requires forward-looking risk assessment and scenarios on development pathways. Non-predictability and non-linearity of risks, with possibility of ‘tipping points’ (irreversible and with self-reinforcing features). Potential systemic nature due to interrelation of risks. Climate-nature nexus – mutual reinforcement of risks and opportunity of compound mitigation measures.

Different: biodiversity risk is even more multi-dimensional (related to intricate functioning of ecosystems) and cannot be reduced to a single metric (as is the case for e.g. climate - global warming metric of GHG emissions). This requires handling multiple indicators, including species richness, or indicators on the intactness of land and water resources. Biodiversity risk is of a more local/regional nature, risk data is more difficult to collect and ecological interactions are even more difficult to model than climate change. Possibly more intensified risk concentration, threatening risk pooling across a region.

Comparison Social-Biodiversity/Environment³¹

Similar: both risks are subject to local and regional specificities. Similar risk typology of transition and physical risks applies (for social: social transition risk - misalignment with social developments, social physical risk - impact of social risks on physical and mental integrity). Possibility of identification of high impact economic activity (exposed to transition risk) and high dependency activity (exposed to physical risk). Note: social-environmental nexus – environmental risks can exacerbate social risks; environmental objectives can support social objectives.

Different: social risk subject less common ‘science-based’ risk indicators, targets and scenarios: minimum social safeguards based on international conventions, local or national targets reflecting national social and labour or communal specificities. Progress in EU regulation (e.g. SFDR³², CSRD³³) provides an

³⁰ EIOPA (2023b), p. 7 ff.

³¹ EIOPA (2023a). Prudential Treatment of Sustainability Risks, p.110 ff.

³² European Commission (2022b). Commission Delegated Regulation (EU) 2022/1288 of 6 April 2022 supplementing Regulation (EU) 2019/2088 of the European Parliament and of the Council with regard to regulatory technical standards specifying the details of the content and presentation of the information in relation to the principle of ‘do no significant harm’, specifying the content, methodologies and presentation of information in relation to sustainability indicators and adverse sustainability impacts, and the content and presentation of the information in relation to the promotion of environmental or social characteristics and sustainable investment objectives in pre-contractual documents, on websites and in periodic reports (SFDR).

³³ European Commission (2022a). Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (CSRD). European Commission (2023b). Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards (ESRS).

increasingly stable framework of social risk indicators; currently less far advanced regarding biodiversity risk.

24. As a result of the interconnection of climate and biodiversity risks, there is a risk of overburdening undertakings in requiring separate risk assessment of biodiversity risks that are strongly related to climate risk, and for example, natural catastrophes. Since biodiversity risks are often intricately linked to other environmental risks, undertakings should consider which other risks are already being assessed as part of its risk management. Requiring separate assessments may also lead to a potential overestimation of the risks. At the same time, due to the specificities of biodiversity risk, the local and regional nature of some risks, the risk assessment may require a targeted risk assessment. Undoing their inter-relation with climate or other environmental risks may on the other hand, lead to potential underestimate of the risk. For natural catastrophe risks, undertakings should consider climate as well as biodiversity related risks.
25. To address these concerns, both holistic integrated climate-nature scenario assessments and specific (regional, local), tailor-made biodiversity risk scenarios may be needed. Both approaches are compatible, and their implementation may depend on the undertakings' portfolios.
26. Attempts are being made to develop integrated scenarios for use by financial institutions.³⁴ Such more holistic scenarios could integrate global warming, biodiversity as well as other sustainable development goals. Natural catastrophe modelling may in the future need to consider increasingly the interaction between climate change and biodiversity, to assess potential losses, but also opportunities for adaptation measures.
27. Other examples exist of local or regional scenarios to assess a specific type of nature related risks.³⁵
28. The report further analyses developments and use of scenarios for financial risk assessment of biodiversity risk in section 4.3.
29. The report integrates both the broad approach to defining biodiversity risk, useful for narrative purposes, and the narrower identification of the exposure of investments and liabilities to activities with high impact or dependency on specific ecosystem services, for the purpose of exposure and financial risk assessment, respectively.

Question to stakeholders:

³⁴ See for example, the report on an integrated climate-nature scenario approach for the assessment of climate and nature-related economic and financial risk: Nature Finance (2024). Climate-nature scenario development for financial risk assessment: Invitation for Feedback on Scenario Development Framework. See also, for example, an investment risk scenario integrating climate-focused land use policy, incorporating protected areas, land restoration and emerging nature markets: Inevitable Policy Response (IPR) (2023). Forecast Policy Scenario + Nature (FPS + Nature). Preparing financial markets for climate- & nature-related policy & regulatory risks.

³⁵ DNB (2023). The economic and financial stability repercussions of nature degradation for the Netherlands: Exploring scenarios with transition shocks. Occasional Studies Volume 21-02.

Q1: In your view, should biodiversity risks be assessed together with climate risks, or subject to a dedicated risk assessment? Please explain.

Q2: Would you agree that for financial risk assessment purposes, insurers could be guided by identifying their exposure of investments or liabilities to (i) economic activities that are dependent on biodiversity and ecosystem services and (ii) economic activities that impact biodiversity and ecosystems ('biodiversity footprint')?

2.2 BIODIVERSITY RISK DRIVERS FOR INSURERS

30. **(Re)insurers are primarily exposed to indirect biodiversity risks through their investments and liabilities.** These risks transmit to the insurers balance sheets by investing in or providing coverage to companies that have not adapted to the transition toward a low impact (i.e., nature-positive or neutral) environment or that are face increasing risks due to declining biodiversity and ecosystem services. The sources of these risks are transition risks and physical risks, respectively. These risks can indirectly impact an undertaking's prudential risks, such as market risk, health, life or non-life underwriting risk, counterparty default risk, or operational risk.

Indirect transition and physical risks

31. Transition risk arises when (re)insurers' asset and liabilities portfolios are misaligned with developments aimed at reducing or reversing damage to nature, such as new policies, technological advances, legal requirements, or changes in consumer preferences. For example, transition risks can emerge from the introduction of new regulations, like the EU Nature Restoration Law, or from a sudden technological breakthrough that significantly reduces the negative impact of an economic activity (e.g. in the construction or agricultural sector) on biodiversity.

Box 3: Transition risk examples

Examples of transition risk affecting underwriting risk: There is a risk of mispricing and increasing claims due to tightening (or increase) of legal requirements for due diligence or mandatory liability for environmental damage. Transition risks may materialise as higher claims in liability insurance (e.g., Environmental Liability or Directors and Officers insurance).

Examples of transition risk affecting market risk: There is a risk of declining asset values from investments in companies that significantly impact biodiversity or operate in areas that become protected due to nature restoration efforts. Increasing or changing regulatory requirements for arable land could lead to a loss in land value. Financial markets may also reassess expectations of a future transition to biodiversity-focused economy, such as under the EU Biodiversity Strategy, resulting in price declines of assets related to land-intensive or chemical companies.

32. Physical risk arises from the materialisation of damage to nature, changes in natural stocks and flows, or the decline of ecosystem services, which can lead to increased losses in investments or

liabilities. Different lines of business are affected differently by physical biodiversity risks. For example, environmental liability risks may be particularly relevant for industrial insurers, maritime biodiversity risks for transport insurers, and biodiversity risks relating to the preservation of natural resources for agricultural insurers. Additionally, health insurers may face risks from invasive species (e.g., zoonotic diseases), while property insurers may be concerned with risks associated with water or land use.

33. The same applies to exposure analysis on the asset side: if an undertaking invests heavily in individual companies or sectors that are particularly dependent on or vulnerable to biodiversity risks, it may face increased exposure.

Box 4: Physical risk examples

Examples of physical risk affecting underwriting risk: There is a risk of increasing losses and claims related to:

- Loss of biodiversity and depletion of ecosystems (e.g. degradation of coral reefs or wetlands) leading to increased losses from natural catastrophes in property insurance lines of business or an increase in claims for business interruption insurance.
- Claims exposure from farmers who depend on the flood retention capacity of nearby natural sites. The physical risk exposure of stables to the risk flooding transmits into the insurers' non-life underwriting risk, covering damage to buildings or income protection for agriculture.
- Reduced waterway navigability and nature-related soil erosion causing sinkholes and infrastructure damage, leading to loss of revenue in Marine, Aviation and Transport insurance.
- Loss of revenue due to reduced soil productivity from extensive land-use or the lack of pollination (in crop insurance).
- Increased morbidity and mortality caused by temperature-related deaths or a rise in zoonotic diseases and pandemics due to changes in nature (in Life and Health insurance).³⁶ Other potential impacts relate to the cost of health and life insurance: biodiversity plays a vital role in medicine and research and loss of biodiversity may impact health³⁷ and the provision of health care.³⁸

Example of physical risk transmitting affecting market risk: There is a risk of decline in asset value for investments in activities that heavily depend on natural and biodiversity resources in their production process (e.g., timber, water, fish, plants) due to changes in the provision of ecosystem services.

³⁶ Schmeller, D.S., Courchamp, F. & Killeen, G. Biodiversity loss, emerging pathogens and human health risks. *Biodivers Conserv* **29**, 3095–3102 (2020). <https://doi.org/10.1007/s10531-020-02021-6>.

³⁷ Marselle, M.R., Lindley, S.J., Cook, P.A. *et al.* Biodiversity and Health in the Urban Environment. *Curr Envir Health Rpt* **8**, 146–156 (2021). <https://doi.org/10.1007/s40572-021-00313-9>.

³⁸ Biodiversity: its importance to human health. *Center for Health and the Global Environment, Harvard Medical School, Cambridge, MA*, 23. [10693 Cover \(dcnanature.org\)](https://doi.org/10.1069/3_Cover); Alves, R.R., Rosa, I.M. Biodiversity, traditional medicine and public health: where do they meet? *J Ethnobiology Ethnomedicine* **3**, 14 (2007). <https://doi.org/10.1186/1746-4269-3-14>.

Direct physical and transition risks

34. Insurers can also face direct biodiversity risks, such as physical risk to property held for their own use (e.g., company offices), as well as reputational, legal or operational risks. For example, properties located in landscapes that suffer environmental damage - such as increased flood risks due to soil erosion from deforestation – may face physical risks or properties near nature-sensitive sites (e.g., Natura2000) may face transition risks. Additionally, associations with investees or policyholders who negatively impact nature can lead to direct reputational risk, resulting in loss of policyholders or divestment by stakeholders.
35. Depending on the applicable regulatory framework, insurers may also face direct legal risk from failing to disclose or report adverse environmental impacts, or for not performing due diligence under regulatory requirements for their investees or policyholders. An increase in compliance risks may ultimately harm stakeholder and shareholder value, contributing to operational risk. Furthermore, if an insurer’s strategic decisions lead to an unsustainable business model or fail to meet sustainability expectations, this can cause strategic risk, reducing both the availability of insurable as well as investable assets and affecting business opportunities more broadly.
36. Beyond prudential risks, (re)insurers may also face direct conduct risks. For example, if insurance products are unclear about whether losses caused by biodiversity risks are covered, the increasing exclusions of cover may negatively impact the value of insurance products for consumers.
37. The loss of biodiversity and the degradation of ecosystems can impact economic activities more broadly, affecting insurers at a sectoral level or even the financial sector. Increased natural disasters, resource depletion, health impacts, asset value depreciation, and increased legal risks for economic activities can lead to economic shocks in key industries. These shocks may trigger potential cross-sectoral feedback loops and disrupt global supply chains, which could, in turn, affect the financial sector operating within the global economy.

Question to stakeholders:

Q3: Do you agree with the description of the transmission of biodiversity risk to insurers’ assets and liabilities? Please explain.

3. CURRENT MARKET PRACTICES ON BIODIVERSITY RISK ASSESSMENT

38. The Solvency II framework already sets out requirements for the identification, measurement, management and monitoring of sustainability risks, including environmental risks, such as biodiversity risks.
39. This chapter presents an overview of observed practices by insurance and reinsurance undertakings in the assessment of material biodiversity risk in the context of their ORSA.

3.1 ON GOVERNANCE

40. Main initiatives observed in the market aim at creating risk awareness for biodiversity risks at board level, expressing the need for strategic attention on what undertakings identify as an emerging risk, or a mega trend. Several large undertakings mention in their annual reports that they plan to further refine their strategies, policies, and targets in the coming years to address other environmental topics, including pollution, biodiversity and ecosystems, resource use, and the circular economy.

3.2 ON MATERIALITY AND FINANCIAL RISK ASSESSMENT

41. The identification, measurement and management of biodiversity risks by the (re-)insurance industry is still in the early stages. While some large undertakings have developed more advanced practices, most undertakings consider biodiversity to be an important but emerging risk - a 'megatrend' that is difficult to translate into concrete financial impacts on insurance activities. The most assumed risk is a potential negative impact on investments, such as a decrease in asset values. As a result, biodiversity risk is primarily viewed through the lens of reputational risk. To date, limited of material biodiversity risk analysis has been found in undertakings' ORSAs (FYE 2023).
42. Market participants emphasize the importance of narratives in underpinning scenarios capture the complexity of biodiversity risks, including interlinkages between climate and biodiversity, as well as spillover and compounding effects.
43. Undertakings point out that the scope of the narrative is potentially broad due to numerous interdependencies with other risks. These include not only other environmental risk drivers such as climate, pollution, water, and natural catastrophes, but also the role of biodiversity risk as a risk driver of social and economic risks like poverty, hunger, health, and economic conditions.
44. The interconnectedness with other environmental risks, along with the difficulty of quantifying biodiversity or nature risk using a single metric (as is done for GHG emissions), makes it difficult to address biodiversity risks in isolation. This complexity can make identifying biodiversity risks a cumbersome task for undertakings. Additionally, undertakings must navigate both global macro-level developments and local micro-level dynamics, complicating the creation of decision-useful narratives.

45. The challenge in building these narratives lies in ensuring their relevance to the specific areas and economic activities in which an insurer is investing or underwriting risks. Where available, national risk registers can prove useful in creating more targeted narratives.³⁹
46. As to exposure assessment, several undertakings screen their potential asset exposures to sectors or companies that exert significant pressure on nature. This aligns with a management approach that considers biodiversity risks primarily from a reputational perspective, with a focus on stewardship and engagement strategies. It also reflects the fact that investment exposures may be more easily identified through market risk transmission channels.
47. A few companies have begun identifying biodiversity risks in specific assets or lines of business. These include exposures sectors such as agroforestry (with land use change, including deforestation, as the primary pressure point), health (through emerging diseases or the degradation of life supporting services such as water filtration and soil regeneration), chemicals (e.g., the physical risk of water pollution transmitting into liability risk), and real estate (where construction activities may be impact on nature).

Box 5: Example of nature-related physical and transition risks in agriculture or forestry insurance

In its 2023 annual report, Achmea highlighted the importance of its agriculture insurance portfolio, covering activities such as greenhouse cultivation, arable farming, arboriculture and livestock sectors. The undertaking notes that agriculture insurance is linked to several environmental issues, including nitrogen pollution but also loss of habitat, monoculture and soil degradation.⁴⁰

In its 2022 Biodiversity Report⁴¹ Aviva referred to its underwriting in the forest sector, providing insurance to property and business interruption in lumber manufacturing processes. The primary drivers of tree cover loss are forestry and wildfires.

Box 6: Example on nature-related risks to real estate assets and property insurance⁴²

In its *Climate and Biodiversity report 2023*, a.s.r. notes that its rural properties rely on ecosystem services, such as groundwater and surface water, soil quality, crop pollination and natural disease control. Urban real estate also depends on ecosystem services, such as rainwater runoff

³⁹ HM Government (2023). National Risk Register.

⁴⁰ Achmea (2023). Annual Report 2023.

⁴¹ Aviva (2022). Biodiversity Report.

⁴² a.s.r. (2023). Climate and biodiversity report 2023.

and vegetation-based heat regulation. Disruption of these services can lead to lower crop yields, higher costs for maintenance and insurance costs, investments to cover risks and a decline in property values. For transition risks, the undertaking highlighted the risk of legislation and regulations including the expansion of Natura 2000 sites with associated restrictions, nitrogen policy and stricter sustainability requirements for buildings. These could result in higher investment and financing costs, and reduced tenant demand for less-sustainable properties.

For its underwriting portfolio, a.s.r found approximately 16.5% of business insured under its P&C policies are located within one kilometre of a Natura 2000 site. To assess the impact, a.s.r prioritised companies with a high (potential) impact or dependency on nature loss in nearby Natura 2000 sites. The undertaking estimates that approximately 3% of the insured companies met the criteria for having a potential high impact on biodiversity, and physical and transition risks for the P&C activity could arise from nature loss, such as an arable farm relying on dry land, which may face flooding if a nearby site's water retention capacity declines. This could cause water damage to farm buildings or result in reduce production, leading to a potential increase in claims costs and/or loss of premium income. Transition risk could result measures to better protect Natura 2000 sites which could cause increasing groundwater costs near natural areas or temporarily banning its use during droughts. The example was made of claims under liability or income protection from building companies who operate near a freshwater because of regulatory requirements on use of freshwater or the prevention of pollution.

3.3 ON TARGETS AND ACTIONS

48. Consistent with the observation that biodiversity risks are primarily considered as emerging and reputational risks, a number of insurers publicly commit to industry-wide pledges, such as the Finance for Biodiversity Pledge, where financial institutions pledge to protect and restore biodiversity through their financial activities and investments by collaborating and sharing knowledge, engaging with companies, assessing impacts, setting targets, and publicly reporting on these actions.
49. Currently, most investment or underwriting decisions to mitigate risks are based on the potential impact of the investee or policyholder on nature and biodiversity.
50. There is no clear distinction between de-risking measures aimed at reducing explicit financial risks (e.g., increased claims or asset depreciation) and impact measures focused on limiting reputational risks or achieving positive environmental outcomes. Risk management actions by undertakings are primarily focused on engagement and stewardship strategies to better understand and manage potential risks, including support for nature-positive initiatives. This can involve integrating biodiversity targets in investment strategies.
51. Following recurring targets have been identified:
 - Reducing potential biodiversity-related impacts of an organization's own operations (e.g., through issuing activities or vehicle fleet management).

- Exclusion of insurance/investment in/of sites within (vicinity of) sensitive areas listed in UNESCO list of world heritage sites, or NATURA2000 sites if the investment /activity has a specific detrimental effect on biodiversity.
- Screening based on geolocation in initial project acquisition
- Establishing a target percentage of customers in the commercial portfolio for whom an engagement strategy has been developed or setting a target number of dialogues and engagements related to investments.

Box 7: Examples of initiative in support of nature-based solutions in marine conservation.

- The AXA XL Coastal Risk Index: This index integrates protective benefits of coastal ecosystems into insurance risk models. It supports the case for investing in nature-based solutions by estimating the potential benefits of the coastal ecosystem (coral reefs, mangroves) to assets and populations in different flooding scenarios.⁴³
- Marine Protected Area (MPA) Insurance Coverage: In collaboration with governmental and non-governmental organizations, insurance products have been designed to cover MPAs, limiting the impact of natural catastrophe losses. For instance, in Belize, insurance covers the Marine Reserve of the Turneffe Atoll, which includes 132,000 hectares of coral reefs. In the Philippines, Philippines, a network of reserves in northern Oriental Mindoro covering 5,200 hectares of coral reef, on which 12,000 fishers depend, is insured. A payout is triggered within days if a cyclone comes within a 50km radius of the MPAs. Once compensation is activated, the social enterprise Blue Finance engages in activities to restore weakened marine ecosystems, such as cleaning up debris and repairing damaged corals. Blue Finance also allocates funding for repairing MPA equipment, such as guard posts, and covers operating losses related to ecotourism and artisanal aquaculture.⁴⁴

Box 8: Examples of engagement strategies in the agro-forestry sector

Promotion of biodiversity within rural properties: Farmers who lease agricultural land from a.s.r. are actively encouraged to manage the land sustainably, which positively impacts biodiversity. To support sustainability efforts, a.s.r. reduces the rents for farmers with whom additional agreements have been made. In the first three years, farmers receive a 10% discount, followed by a 5% discount

⁴³ AXA XL Ocean Risk Initiative (2021). Coastal Risk Index.

⁴⁴ University of Cambridge Institute for Sustainability Leadership and Howden (CISL and Howden), 2024. Nature-related financial opportunity use case: The role of mangroves, coral reefs and seagrasses in supporting and protecting near-shore fisheries in Bolinao, the Philippines. Cambridge, UK: University of Cambridge Institute for Sustainability Leadership. [opportunity-use-case-howden.pdf \(cam.ac.uk\)](https://www.cisl.cam.ac.uk/opportunity-use-case-howden.pdf).

in subsequent years. This scheme provides farmers with financial security and the flexibility to invest in sustainability.⁴⁵

Engagement strategy for agriculture insurance portfolios: Achmea highlighted its engagement strategy within its agriculture insurance portfolio, focusing on several environmental themes. Through discussions with agricultural businesses, including via permanent consultation structures like sector councils, the company gains insight into sustainability issues and explores potential solutions.⁴⁶

Financial Sector Commitment Letter on eliminating commodity-driven deforestation: Several institutional investors, including insurers, have signed this commitment to address biodiversity loss. By 2025, signatories will publicly report on their progress in eliminating forest-risk, agricultural commodity-driven deforestation in their investment portfolios. They will only invest in entities that meet risk-reduction criteria and will increase investments in nature-based solutions.⁴⁷

⁴⁵ a.s.r. (2023).

⁴⁶ Achmea (2023). Annual Report 2023, p. 61.

⁴⁷ [nature-and-tackling-deforestation - Climate Champions \(unfccc.int\)](#).

4. BIODIVERSITY RISK ASSESSMENT IN SOLVENCY II

4.1 GENERAL FRAMEWORK

52. Considering observed market practices, in this chapter, EIOPA indicates practices that can support the consideration of biodiversity risks by insurance and reinsurance undertakings, in assessing their potential materiality and financial implications. The purpose of setting out available practices is to initiate the exchange with the insurance sector on the potential materiality of the risk for their activities, the available data and methodologies, as well the challenges and possible solutions to identify and manage biodiversity risks. To ensure efficiency and proportionality, these practices build on the existing requirements in the Solvency II Framework and consider the ongoing work on the integration of sustainability risk management practices as part of the work on 'sustainability risk plans'.
53. The Solvency II Directive 2009/138 and Delegated Regulation (EU) 2015/35 set out requirements for the identification, measurement, management and monitoring of sustainability risks, including environmental risks, such as biodiversity risks.
54. Insurers are required to integrate all sustainability risks into their governance and risk management processes into their governance system, risk-management system, and ORSA, in accordance with Articles 44(2), 45(2) and 45a of the Solvency II Directive and Article 260(1)(a) of the Delegated Regulation. The risk management function must identify and assess sustainability risks, which should form part of the (re)insurers' own risk and solvency assessment (ORSA) (as per Article 269 SII DA, with reference to Articles 262 SII DA and 45 SII Directive regarding ORSA).
55. The Delegated Regulation specifies the following:
 - **Risk management function:** The risk management function is responsible for identifying and assessing emerging risks and sustainability risks (Article 269 (1) (e) Delegated Regulation). Sustainability risks identified by the risk management function must be included in the ORSA (Article 269 (1a) Delegated Regulation). These risks must also be integrated into the underwriting and reserving policy, investment policy, and, where other policies (e.g., ALM, liquidity, concentration, operational, reinsurance and other risk mitigating techniques, deferred taxes risk management). The underwriting and reserving policy must include actions to be taken by the undertaking to assess and manage risks related to inadequate pricing and provisioning assumptions due to sustainability risks. The investment risk management policy must detail actions to ensure that sustainability risks in the investment portfolio are properly identified, assessed and managed.
 - **Prudent person investment principle:** For risk management purposes, when identifying, measuring, monitoring, managing, controlling, reporting and assessing risks arising from investments, undertakings shall take into account the potential long-term impact of their investment strategy and decisions on sustainability factors and the sustainability preferences of its customer (Article 275a Delegated Regulation (EU) 2015/35).
 - **Actuarial function:** As part of its responsibility for the underwriting policy, the actuarial function must include conclusions regarding the effect of sustainability risks in its opinion

(Article 272 (6) (b) Delegated Regulation). Additionally, the actuarial function must consider all relevant information, including on sustainability risks, into account in its other tasks, such as assessing the adequacy of technical provisions (Article 272 (2) Delegated Regulation (EU) 2015/35).

- **Remuneration policy:** The remuneration policy must include information on how it integrates sustainability risks in the risk management system (Article 275 Delegated Regulation (EU) 2015/35).⁴⁸

56. In addition to the explicit references to the integration of sustainability risks in the governance and risk management of undertakings,

- The handling of sustainability risks must be appropriately considered in the relevant written policies (Article 41 (3) of the Solvency Directive)
- Employees must be empowered and informed so that they can properly carry out the tasks assigned to them (Article 258 (1) (e) (f) Delegated Regulation (EU) 2015/35), and
- The compliance function must also assess potential compliance risks related to both existing and new requirements on sustainability (Article 46 (2) Solvency II Directive 2009/138).

57. The administrative, management or supervisory body AMSB would need to set out the risk strategy and appetite, supported by the written policies that would specify how the undertaking intends to deal with biodiversity risks (targets and actions).

58. Furthermore, biodiversity risk should form part of materiality and financial risk assessment as part of the 'sustainability risk plan' under Solvency II, as required by Article 44 of the Solvency II Directive.⁴⁹ While the requirements for the sustainability risk plan are under development, reference is being made to the overall proposed structure for the integration of sustainability risks into risk management practices, as set out in EIOPA's Consultation Paper on the proposal for Regulatory Technical Standards on management of sustainability risks including sustainability risk plans.⁵⁰

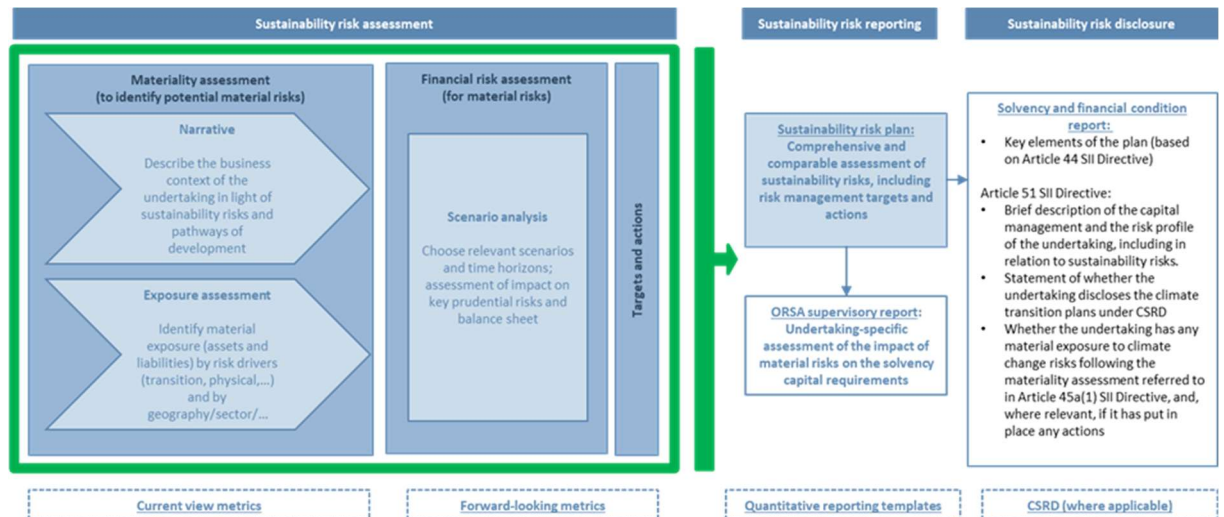
59. The proposed structure of the sustainability risk plans includes a materiality assessment, composed of a narrative and exposure assessment, and where risks are deemed material, a financial risk assessment to be performed as part of the ORSA. The risk assessment would be supported by relevant metrics, and the management and monitoring would be guided by relevant targets and proposed actions.

Figure 2: Overview of phases for sustainability risk assessment (based on EIOPA Consultation Paper on sustainability risk management, including sustainability risk plans)

⁴⁸ European Commission (2021a). Commission Delegated Regulation (EU) 2021/1256 of 21 April 2021 amending Delegated Regulation (EU) 2015/35 as regards the integration of sustainability risks in the governance of insurance and reinsurance undertakings (**Solvency II Delegated Regulation**).

⁴⁹ Date of entry into force pending.

⁵⁰ Add reference when published.



4.2 MATERIALITY ASSESSMENT

60. As part of the ORSA process, undertakings are expected to identify all material sustainability risk to their business. This involves assessing these risks in terms of their materiality.
61. In the context of Solvency II, risks are considered material when ignoring them could influence the decision-making or judgement of the users of the information.⁵¹ For the ORSA, the primary users of this information are the undertaking's administrative, management or supervisory body (AMSB) and its relevant staff.⁵²
62. The AMSB establish undertaking-specific limits for materiality in advance, determining which risks require their attention and decision-making. For a proportionate assessment, the undertaking should consider the nature, scale and complexity of the underlying biodiversity risks. Indicators for assessing the proportionality of biodiversity risks can be, for example, the size of relevant exposure, the impact of biodiversity risks on this exposure and the probability that the impact will take place.
63. When assessing the biodiversity risks and determining their materiality, the undertaking must consider the risk in both the short term and longer term. As the materialization of these risks will most likely materialise over a longer time horizon, the medium-to-longer term consequences of biodiversity losses for the undertaking itself should be considered in the assessment.
64. The aim of the materiality assessment is to evaluate risks at least qualitatively and ideally quantitatively, and determine which risks are material to the undertaking - i.e., those that exceed the materiality limit set by the AMSB.
65. The materiality assessment would consist of a narrative and exposures assessment, which both aim to identify the main drivers of potential material risks.

⁵¹ See Recital 1 and Article 291 of the Solvency II Delegated Regulation.

⁵² See Article 305 of the Solvency II Delegated Regulation.

4.2.1 NARRATIVE

66. The narrative involves identifying the main direct and indirect drivers of biodiversity risk that could impact the undertaking's investment or underwriting activities.
67. The narrative can distinguish between nature-related risks that are transmitted into society either directly ("first-order"), indirectly (i.e., "second order", for example through value chains) or via spill-over effects (contagion), which affect citizens, businesses and the economy. An accumulation of economic impacts at the micro-level (e.g., business level) can lead to consequences at the meso-level (e.g., at local government level). When these effects occur on a larger scale (national, regional or global), they can lead to macroeconomic impacts, such as the disruption of value chains, volatility in raw material prices, business relocations or adjustments, or an increased rate of capital depreciation.
68. The NGFS identifies narratives as the essential first step conducting any scenario-based risk assessment: "Narratives are storylines that describe how the world could evolve in the future, considering likely socio-political, macro-financial and environmental trends. In essence, narratives can help to characterise the transformations of the direct and indirect drivers of nature loss or the economy that could take place".⁵³

Assessment of the business context

69. To help undertakings build a relevant narrative for identifying their exposure to biodiversity risk, the first step would be to assess the business context. This involves considering the nature and size of the portfolio (assets and liabilities), its duration, concentration and diversification options.
70. Financial risks arising from biodiversity loss that affect the undertaking ('outside-in'), and financial risks for the undertaking due to its impact on biodiversity ('inside-out'), should both be assessed for materiality. Such 'footprinting approach', allows the undertaking to conduct a materiality assessment for aggregated impacts at portfolio level.⁵⁴ To address financial risks to assets and liabilities involves assessing the potential long-term financial impacts of insurers' investments and underwriting on biodiversity risks, while also considering risk management measures to mitigate this impact.
71. This reflects the double materiality principle, which is a core aspect of the European Green Deal. The double materiality principles requires the systematic integration of both financially material sustainability risks and impacts in financial decision-making processes.⁵⁵ Under Solvency II, insurers must consider the impact of their investment strategy and decisions on sustainability

⁵³ NGFS (2023b). Recommendations toward the development of scenarios for assessing nature-related economic and financial risks_p. 20.

⁵⁴ See for further insight: TNFD (2024a). Discussion paper on biodiversity footprinting approaches for financial institutions.

⁵⁵ European Commission (2021b), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Strategy for Financing the Transition to a Sustainable Economy, COM/2021/390 final.

factors.⁵⁶ Insurers subject to EU sustainability disclosure regulations such as the CSRD are required to adopt a double materiality approach for identifying and assessing financial risks and impacts related to biodiversity.

72. For example, if an insurer specialises in underwriting risks for a particular industry sector that negatively impacts biodiversity, its underwriting activity may indirectly contribute to biodiversity loss and ecosystem degradation. Consequently, financial risk may materialise via underwriting risk due to increased potential for liability claims against the policyholder related to biodiversity harm, or the risk that the policyholder may be unable to pay premiums if legal restrictions on their activities cause financial hardship. There is also potential reputational risk for the undertaking, as its investors may choose to exclude the undertaking from their portfolio. Investors' divestment could also negatively affect the undertaking's share price.
73. If these risks are deemed financially material, they should be further assessed in the ORSA.
74. Investment and underwriting are the two main activities where insurers tend to identify their main exposures and impacts on biodiversity. However, undertakings can also consider other areas, such as operations, outsourcing and corporate social responsibility activities.

Assessment of the risk drivers

75. In the second step, identifying specific physical and/or transition risks is a crucial part of the narrative. The relevant risk factors for an undertaking when assessing biodiversity risks would include direct biodiversity risks (for example, mapped to the IBPES risk drivers as referred to previously), and could also involve indirect drivers of biodiversity or nature degradation, as well as micro- and macro-economic factors that contribute to or are impacted in turn by biodiversity risks.
76. The economic factors can include micro- and macroeconomic factors. Micro-economic factors can include capital destruction and stranded assets, the price volatility of raw materials, disruptions of production processes and value chains, the relocation and adjustment of economic activities or other externalities (e.g. taxation). Macro-economic factors can include inflation, productivity effects on GDP, capital needs for mitigation and adaptation and their impacts on government budgets.
77. Demographic and socio-cultural drivers refer to societal values and behaviours, including production and consumption patterns, trade, and human population dynamics.

Figure 3: Indirect and direct drivers and examples of biodiversity and ecosystem degradation. Source: Swiss Re Institute, based on IBPES 2019.⁵⁷

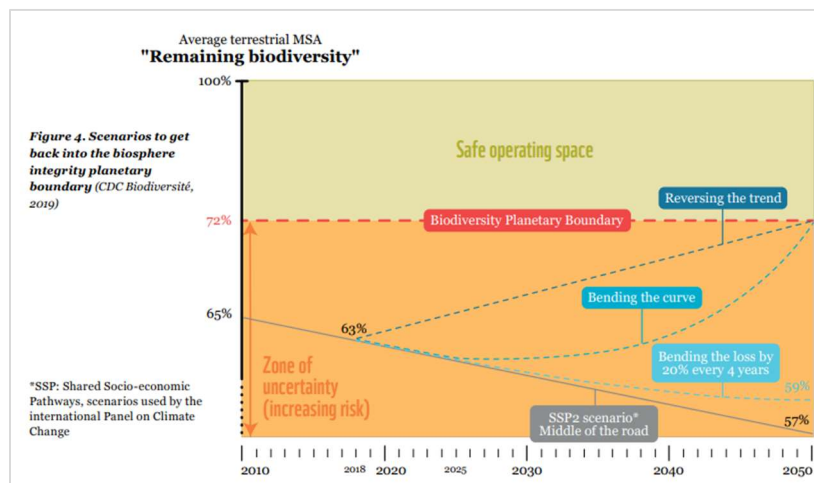
⁵⁶ Art. 275a of the Solvency II Delegated Regulation.

⁵⁷ Swiss Re Institute (2020). Biodiversity and Ecosystem Services A business case for re/insurance.



78. As part of the narrative, undertakings can refer to global pathways that outline the potential evolution of biodiversity risk (see Figure 6). Global and EU targets for biodiversity preservation and restoration [see section 4.4 of the report] also help frame the narrative by providing expected transition scenarios.

Figure 4: Pathway to get back into the biosphere integrity planetary boundary. Referred to in WWF Report FR 2019 „Into the wild. Integrating nature into investment strategies “, p. 59, sourced from CDC Biodiversité 2019.



79. In its work on developing physical and transition scenario narratives to assess nature-related financial risks, the NGFS has identified several avenues that can support sector and country analysis, as well as comprehensive nature-related risk analysis. These narratives would serve as an initial step in developing relevant nature-related scenarios for the purpose of financial risk assessment.

80. Three key challenges in developing such scenarios are (i) the local specificities, complexities and non-linearities of natural systems which make it difficult to create global measures for biodiversity risk (equivalent to the CO2 measures for climate); (ii) the interdependency of the environmental

risks, including both positive and negative synergies and (iii) the fact that the substitutability of nature is generally overestimated in the short and medium term.⁵⁸

Question to stakeholders:

Q4: Do you identify relevant market practices of undertakings in describing their narrative on the impact of biodiversity risks to their business?

4.2.2 EXPOSURE ASSESSMENT

81. The second step of the materiality assessment involves analysing exposures related to dependencies on biodiversity and/or the impacts of economic activity on biodiversity to identify material sources of physical and transition risks.
82. Assessing the dependency of economic activities on nature, or their impact on nature, can help identify sources of physical and transition risks. In turn, this assessment aids in evaluating insurers' potential exposure to these risks through their investment and/or underwriting portfolios.
83. The results of the exposure analysis can 1) indicate whether the potential exposure is material; 2) help identify clusters, sectors, or ecosystems.
84. Exposure assessment can be conducted by identifying the exposure of assets or liabilities to:
 - (i) Economic activities that are dependent on biodiversity and ecosystem services. This approach involves using mappings of production processes to biodiversity and ecosystem services, which assess their degree of dependency. This enables assessing the exposure of an activity to nature-related physical risks, as high dependency implies high exposure to the physical risk of damage to nature.
 - (ii) Economic activities that have an impact on biodiversity and ecosystems ('biodiversity footprint'). This approach builds on the assessment of the contribution of an economic activity to changes to biodiversity and ecosystems, either from its own operations or from the operations it enables (e.g., through investments or insurance). This enables assessing the exposure of an activity to nature-related transition risks, as a high footprint indicates that the activity may face increased conservation and restoration measures through regulation or lower consumer preferences in the future.
85. The exposure assessment can provide both high-level quantitative and qualitative insights into the potential materiality of the risk the insurer may face. The analysis can focus on the most significant factors influencing biodiversity risks that are relevant to the undertaking's own business activities. It is crucial to consider which regions, business areas and asset classes are relevant for the undertaking and may be particularly affected by biodiversity risks. For assessing its exposure an undertaking can, for example, identify the amount of premiums written in economic sectors with a high dependency on biodiversity and ecosystem services and/or high biodiversity footprint (economic exposure). It can also assess the potential exposure to biodiversity risk in a particular region or geography (geographical exposure).

⁵⁸ NGFS (2023b), p. 46.

86. This type of exposure assessment aligns with what the NGFS refers to as a short-term option for static analysis on the path toward more dynamic scenario analysis for quantifying nature-related risks over the long term. The NGFS suggests the use of input-output models to assess sectoral exposure, and to use bio-physical models for static maps of physical hazards (geographical exposure).⁵⁹ The next, more critical step is translating such 'ecological patterns' into financial risks for the insurer, by generating financial risk indices.
87. Data sources for assessing investment and underwriting risk exposures based on Solvency II are set out below. Data to assess underwriting risk exposures is more limited compared to data for investment activities, and the limitations of the data sources, especially for underwriting risk, are set out in Annex I.

Box 9: Overview of Solvency II available QRT data sources for investment and underwriting exposure to biodiversity risk

	SII QRT	Type of asset / underwriting	Geographical breakdown	Sectoral breakdown
Investments	S.06.02	Financial assets	Country-level	NACE sector
		Real estate	Address-level	
Liabilities	S.04.05	LoB	Country-level	-
	S.17.03	LoB	Country-level	-
	S.21.02	If biodiversity/nature-related risk is identified as one of the top twenty non-life underwriting risks.		

88. A more detailed asset analysis can be conducted for individual holdings within specific section of the insurer's portfolio, such as significant investments in forests or agricultural land. If the undertaking operates heavily in certain regions (either as an insurer or investor), the exposure analysis should also take consider the regional nature-related risks. For example, if the undertaking's business is particularly concentrated in coastal areas, the risk profile will differ compared to operations inland. Additionally, internationally active undertakings must account for national variations in laws and objectives.
89. When assessing the material of potential exposures, insurers should consider both the direct impacts and dependencies on biodiversity, as well as the risks that can arise through value chains and indirect transmission channels. For example, natural disasters can negatively impact a region's biodiversity, such as when habitats for local species are destroyed. In turn, a decline in biodiversity (e.g., flora in vulnerable areas such as steep slopes or coasts) can increase the potential damage and/or likelihood of natural disasters occurring. Similar interactions are conceivable for pandemic risks. Loss of biodiversity can promote the emergence of new pandemics in regions where they

⁵⁹ NGFS (2023b).

previously did not occur, while new pandemics can stress for endemic biodiversity. Biodiversity is also strongly connected with the climate change, as described in an earlier section of the report.

90. At the same time, it is challenging to perform a biodiversity materiality assessment including all potential impacts and dependencies, without recurring to scenario analysis, which would be appropriate for material risks.

Box 10: Examples of tools and methods for biodiversity exposure risk assessment

The following examples show tools or data sets that can help in conducting high-level exposure assessments of biodiversity risk at sectoral and geographical level.

Ecosystem services exposure: The Biodiversity and Ecosystem Services index (BES index)⁶⁰ identifies the services of relevance for insurers' activity.

Other risk maps for biodiversity and environmental risks include:

Sub-area	Tool	Source
Biodiversity	Biodiversity risk filter ⁶¹	WWF
Deforestation	Global Forest Watch ⁶²	WRI
Multiple	ENCORE ⁶³	NCFA, Global Canopy, UN
Protected Areas	SIGHT ⁶⁴	WWF
Water	Aqueduct ⁶⁵	WRI
	Water risk filter ⁶⁶	WWF
	Corporate bonds water credit risk ⁶⁷	NCFA, Global Canopy, UN

⁶⁰ Swiss Re (2020). Biodiversity and Ecosystems Services Index: measuring the value of nature

⁶¹ See <https://riskfilter.org/biodiversity/home>.

⁶² See <https://www.globalforestwatch.org/>.

⁶³ See <https://encorenature.org/en>.

⁶⁴ See <https://wwf-sight.org/>.

⁶⁵ See <https://www.wri.org/aqueduct>.

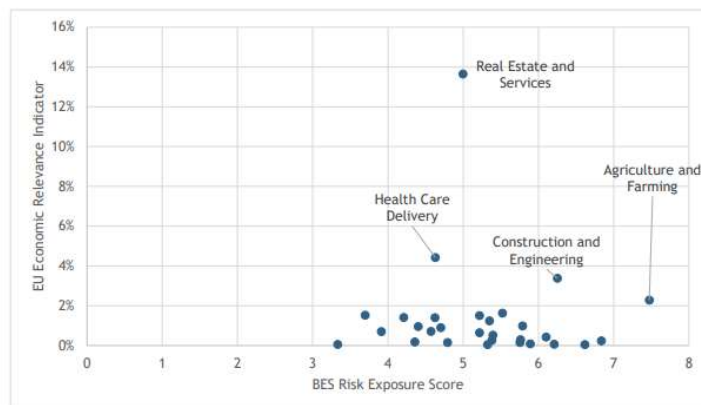
⁶⁶ See <https://riskfilter.org/water/home>.

⁶⁷ See <http://www.naturalcapitaldeclaration.org/bonds-water-scarcity/>.

Drought stress testing tool⁶⁸

NCF, Global Canopy, UN

Economic exposure: Mappings of biodiversity and ecosystem services (BES) risk exposure with relevant economic sectors, score the sectors on impact and dependency. An example for the EU economy below shows that real estate and construction, agriculture and farming, and health care delivery are the most critical areas from the EU perspective when assessing biodiversity risks.⁶⁹



At a global level, the Sustainable Insurance Forum (SIF) provided a mapping of exposure to economic sectors. This mapping suggests that subject to firm- and geography-specific characteristics, seven economic sectors, contributing to about 10 percent of the global P&C insurance premium, could be exposed to significant disruption as nature-related risks become more severe. The business sector contributing the most to global insurance premiums is pharmaceutical, healthcare, life sciences and biotechnology, followed by the automotive or motor sector.⁷⁰ Other datasets on impact and footprints include the Global Biodiversity Score and the Corporate Biodiversity Footprint (CBF, Iceberg Data Lab).⁷¹

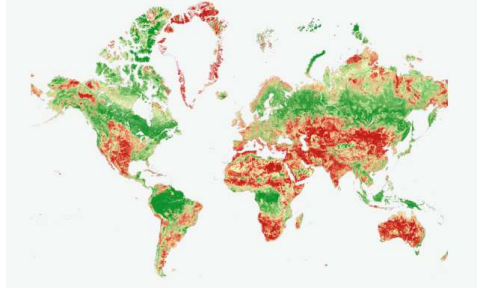
Geographical exposures (e.g., spatial maps of land use): The BES Index enables locating at a 1km² resolution, which ecosystem services are relevant in each location and assess their health status (with red areas indicating fragile areas).

⁶⁸ See <https://www.unepfi.org/drought-stress-testing-tool/>.

⁶⁹ European Commission (2024).

⁷⁰ UNDP Sustainable Insurance Forum [SIF] (2021). SIF scoping study: Nature-related risks in the global insurance sector.

⁷¹ Global Biodiversity Score (CDC Biodiversité which assesses impact and dependency of companies and investments on biodiversity) [Global Biodiversity Score: 2023 update | CDC Biodiversité \(cdc-biodiversite.fr\)](#); Corporate Biodiversity Footprint (CBF, Iceberg Data Lab) which, based on the concept of Mean Species Abundance (MSA) assesses the degradation of ecosystems caused by business activities, [Iceberg Datalab](#).



Additional datasets can support spatial risk exposure analysis, mapping the fragility or intactness of nature, to provide a static risk exposure view for specific geographies:

- Globio⁷²: A model based on terrestrial biodiversity databases that expresses biodiversity intactness using the mean species abundance indicators. It accounts for pressures on biodiversity arising from land use, road disturbance, land fragmentation, nitrogen deposition, and climate change.
 - Integrated Biodiversity Assessment Tool (IBAT)⁷³: Combines global diversity datasets on threatened species and protected or 'key biodiversity' areas to identify critical biodiversity regions.
 - Strong Environmental Sustainability Index (SESI)⁷⁴: Based on the Environmental Sustainability Gap (ESGAP) framework, the index measures environmental sustainability across countries on a range of environmental and resource issues.
91. UN Biodiversity Lab⁷⁵: A platform providing access to global datasets on biodiversity, climate change and sustainable development.
92. Heatmaps can assist in illustrating the sectors' exposed to nature-related risks. An example of such heatmap is provided in the TNFD Guidance on the identification and assessment of nature-related issues (the TNFD LEAP approach).⁷⁶

⁷² [GLOBIO - Global biodiversity model for policy support - homepage | Global biodiversity model for policy support.](#)

⁷³ Offering geographic information on the presence of Protected Areas, Key Biodiversity Areas and Endangered species. [Integrated Biodiversity Assessment Tool \(IBAT\) \(ibat-alliance.org\).](#)

⁷⁴ Arkaitz Usubiaga-Liaño, Paul Ekins, Monitoring the environmental sustainability of countries through the strong environmental sustainability index, *Ecological Indicators*, Volume 132, 2021, 108281, ISSN 1470-160X, <https://doi.org/10.1016/j.ecolind.2021.108281>.

⁷⁵ [UN Biodiversity Lab – Providing decision makers with the best available spatial data to put nature at the center of sustainable development.](#)

⁷⁶ TNFD (2023a). Guidance on the identification and assessment of nature-related issues. The TNFD LEAP approach.

SASB Sectors	Dependencies		Impacts						AUM (% of total)
	Soil quality	Water quality	Land use		Water use		Pollution		
			Land use	Water use	Air pollution	Solid waste pollution	Soil pollution	Water pollution	
1 Agricultural products and tobacco	High	High	High	High	Low	Low	High	High	2%
2 Consumer goods	Low	Low	Low	High	Moderate	Low	Moderate	Moderate	5%
3 Extractives and minerals processing	Low	Moderate	High	High	High	High	Moderate	High	14%
4 Financials	Low	Low	Low	Low	Low	Low	Low	Low	18%
5 Food and beverage (ex. agriculture and tobacco)	Low	Moderate	Low	High	Low	Moderate	Low	Low	11%
6 Health care	Low	High	Low	High	Low	Moderate	High	High	6%
7 Infrastructure (ex. utilities and generators)	Low	High	High	Low	Low	High	Low	Low	2%
8 Renewable resources and alternative energy	Low	High	Low	High	Low	Low	High	High	3%
9 Resource transformation	Low	Low	Low	High	Moderate	High	High	High	6%
10 Services	Low	Low	Low	Moderate	Low	Low	Moderate	High	12%
11 Technology and communications	Low	Low	Low	Low	Low	Low	High	High	15%
12 Transportation	Low	Low	Moderate	High	Moderate	Moderate	High	High	5%
13 Utilities and electricity generators	High	High	High	High	High	High	High	High	3%

AUM: Assets under management

Question to stakeholders:

Q5: Please share relevant approaches, tools and practices for undertakings to perform sectoral and/or geographical biodiversity exposure risk assessment.

Q6: Please share relevant approaches, methodologies and reference to relevant data for assessing underwriting risk exposure to biodiversity losses.

4.3 FINANCIAL RISK ASSESSMENT

93. If the biodiversity related risk is deemed material, based on the outcome of the materiality assessment, the undertaking shall subject exposure to financial risk assessment in the ORSA.
94. The ORSA must include all risks that could materially affect own funds and should consider all risk categories included in the calculation of SCR – such as underwriting, counterparty default, market, operational risks -, as well as other risks that may not be fully captured in the SCR Calculation (e.g., strategy and reputational risks). Therefore, the ORSA should incorporate any material financial risks that arise from biodiversity and ecosystem degradation.
95. Particularly for emerging risks like biodiversity risks it is recommended to adopt a forward-looking approach for dynamic assessment of material exposures, by using scenario analysis.
96. In the absence of appropriate scenarios, considering the early stage of biodiversity risk assessment for financial institutions, a high-level qualitative risk assessment at a minimum should be conducted to comply with the ORSA requirements today.⁷⁷ A starting point could be to include biodiversity as an additional risk driver in existing scenarios, particularly in business areas highly

⁷⁷ See EIOPA (2023b).

affected by biodiversity loss, such as health or agriculture insurance or market risk for corporate and real estate bonds.

97. It is also important to consider that biodiversity risks may become more frequent and significant in the future, potentially serving as risk drivers for other risks. This is especially relevant where biodiversity risks are not yet separately identified and comprehensively assessed.
98. One challenge in assessing biodiversity risk is the significant variations in this risk, which varies locally, regionally and in nature. While climate change risks can often be assessed using global scenarios, biodiversity risks today lack universally applicable global scenarios. The selection of scenarios and metrics for biodiversity risk assessments is more complex, as the following section will illustrate.

4.3.1 METRICS AND MODELS TO MEASURE BIODIVERSITY-RELATED FINANCIAL RISKS

99. The use of metrics and models to identify and monitor biodiversity-related financial risks is complex. Challenges include the interconnectedness of biodiversity with other environmental risks, such as climate change, and the need to account for ecosystem degradation using multiple metrics and indicators.⁷⁸ Global metrics are limited in their ability to capture local or regional biodiversity risks. Impact metrics, such as "mean species abundance per square kilometre," can help evaluate the biodiversity impact of a portfolio and provide insights into potential transition risks that could affect insurers' portfolio but are less suitable for directly assessing the financial risk to an insurer. For undertakings with specific geographical or sectoral exposure (e.g., agriculture or forestry), other metrics may be more relevant. Some indication on the type of biodiversity and nature-related metrics is provided in the following paragraphs.

Box 11: Biodiversity and nature-related metrics

The following gives an insight on approaches for defining relevant biodiversity risk metrics, for assessing and disclosing material biodiversity-related financial risk.

In its efforts to promote the disclosure of nature-related risks and opportunities, the **Task Force on Nature-related Financial Disclosures (TNFD)** has established principles for such metrics:⁷⁹

- **Science-based:** Provide insights into the consequences of business and finance activities.
- **Sensitive:** Able to reflect change on an annual basis.
- **Relevant:** Tailored to the business model and value chain of report preparers, recognising that issues can vary significantly within sectors, business models and value chains.
- **Proportionate:** Reflect the practical capacity and cost constraints of report preparers to assemble, assess and report information on an annual basis.
- **Decision-useful:** Provide current insights and comparability within and across sectors.
- **Subject to assurance:** Capable of independent limited assurance in the medium term.
- **Aligned to policy goals:** Aligned with global and national policy goals and targets, such as the indicators and metrics in the Global Biodiversity Framework (GBF) measurement

⁷⁸ NGFS (2023b), p. 23 ff

⁷⁹TNFD (2023c).

framework and other international treaties. This is similar to how organisations align their reporting with the Paris Agreement and net zero targets, as well as other standards and target setting frameworks.

The TNFD framework distinguishes between metrics that aim to locate ('location prioritisation metrics'), evaluate ('dependency and impact metrics'), assess ('risk and opportunity metrics') and prepare to respond ('response metrics', including policies and targets, engagement or capital allocation). The TNFD also distinguishes between core global (applicable to most economic sectors) and core sector metrics, as well as additional metrics. Example of core (and additional) global disclosure metrics for financial institutions⁸⁰ include, for example:

- Dependencies and impacts on nature: Exposure in millions to sectors or companies with high dependency or medium dependency on nature (or high/medium impact on nature); exposure as percentage of total portfolio amount/value.
- Nature-related risks and opportunities: Value of assets, liabilities, revenue and expenses that are assessed as vulnerable to nature-related transition or physical risks (total and proportion of total).
- Responses to nature-related issues: Value of investment in projects that avoid or reduce negative nature impacts or conserve or restore ecosystems or species where impacts cannot be avoided; Proportion of sites that have active engagement with local stakeholders on nature-related issues.

For financial institutions, TNFD disclosures also map reference to principal adverse impacts (PAIs) of investment decisions on sustainability under the **Sustainable Finance Disclosure Regulation (SFDR)**. The ESAs issued their advice to the European Commission on the SFDR at the end of 2023, including the following binding indicators (metrics) on biodiversity:

- Share of investments in investee companies with sites/operations located in or near to biodiversity-sensitive areas where activities of those investee companies negatively affect those areas (Core PAI 7)

Additional (non-binding) indicators include:

- Share of investments in investee companies whose operations affect threatened species (additional PAI 15.1)
- Share of investments in investee companies without a biodiversity protection policy covering operational sites owned, leased, managed in, or adjacent to, a protected area or an area of high biodiversity value outside protected areas (additional PAI 15.2)
- Share of investments in companies without a policy to address deforestation (additional PAI 16)

In addition, the **European Sustainability Reporting Standards (ESRS)**⁸¹, which implement the CSRD, require reporting on

- direct impact drivers of biodiversity loss,
- impacts on the state of species,

⁸⁰ See TNFD (2023b). Guidance for Financial Institutions version 1.0 and TNFD (2024b). Additional guidance for financial institutions version 2.0.

⁸¹ European Commission (2023b). ESRS E4.

- the extent and condition and ecosystems as well as impacts and dependencies on ecosystem services.

Sector specific guidance, including for the financial sector, is being developed by EFRAG.

100. The Network for Greening the Financial System (NGFS) is conducting important work in developing scenarios to assess nature-related financial risks. The NGFS' analysis includes assessing existing approaches for modelling nature's impacts on the economy (nature-economy models), biophysical models and models that identify the transmission of nature related hazards throughout value chains (using input-out tables and models). Some key take-aways from their work to date are summarized below.

Box 12: Key take-aways from NGFS' review of models for assessing nature-related risks

The following is based on the **NGFS Recommendations towards the development of scenarios to assess nature-related economic and financial risks**⁸² and provides a summary of the different types of models which can form the basis for constructing scenarios.

Nature-economy models.

These models combine nature and macroeconomic aspects economic and bio-physical modelling. They aim to estimate sectoral and macro-economic consequences resulting from physical or transition scenarios. The NGFS reviewed six modelling frameworks as to their scope, structure and objectives. The results show that nature-economy modelling is less mature than climate-economy modelling, and currently focus on the effects of the economy on nature, rather than the reverse. For models assessing physical impacts, the dependency of the economy on nature is crucial. These physical or transition risks affect the economy through transmission channels, leading to changes in sector productivity and output, particularly in agriculture, forestry, and energy. Assumptions about sector adaptability (often high in reviewed models) and the relative importance of sectors in the economy significantly influence the results. The NGFS concludes that these models likely underestimate the economic consequences of nature-related hazards. Systematic sensitivity analysis and using a variety of models are recommended to address this issue.

Biophysical models. These models simulate one or more interconnected biological systems, predicting the influence of biological and physical factors on complex ecosystems.⁸³ Various models exist for different biomes, such as agriculture, water, fisheries, fire, and health (related to climate change). While these models represent relationships between ecosystems and emphasise the flow of materials, energy, and species, they do not incorporate economic dimensions, making it difficult to assess economic implications.

Input-output tables and models. To better capture nature-to-economy impacts, complementary modelling approaches, such as multi-regional input-output modelling, are necessary. These models trace the value chains within the economy by showing the origin of inputs to produce goods and

⁸² NGFS (2023b).

⁸³ Definition used by the NGFS, referring to [Biophysical models - Latest research and news | Nature](#).

services and how these products generate profits, income, and taxes. This static snapshot of the global economy can complement macroeconomic models by refining assumptions about the substitution or replacement of production factors.

101. The translation of biodiversity pressures, impacts, and dependencies into financial risks for insurers, with the aim to identify how capital requirements may be sensitive to material biodiversity risks, requires further development.
102. In a recent study, the Dutch National Bank (DNB) conducted an analysis moving from a nature-related shock to economic impact and then to the impact on financial institutions using a series of transition (and one physical) risk scenarios.⁸⁴ While some narratives are inspired by global frameworks, the identification of specific transition and physical risk scenarios by the regulator helps undertakings potentially exposed to these risks at a local or regional level, enabling them to capture the specificity of biodiversity risks in a decision-relevant manner.

Question to stakeholders:

Q7: Please share relevant approaches, tools and practices for undertakings to perform a financial risk assessment for biodiversity risk. Please provide reference to potential scenarios and models.

Q8: Please share references to relevant scenarios for assessing the financial risks of biodiversity loss for specific lines of business or exposures (e.g. agriculture, health, ...)

Q9: Please share references to relevant scenarios for integrated climate-biodiversity financial risk assessment.

4.4 TARGETS AND ACTIONS TO MANAGE BIODIVERSITY RISK

103. Based on the results of the materiality and financial risk assessments, the undertaking should consider appropriate actions aligned with its risk management appetite and strategy. These actions should aim to minimize both the impact of biodiversity loss on the insurer's operations and the impact of the insurer's activities on biodiversity, which can translate into financial risks.

4.4.1 TARGETS

104. As noted earlier, the complexity of environmental interactions makes it nearly impossible to establish a single target for nature-related conservation and restoration, unlike the clear global warming targets set by the Paris Agreement (e.g., limiting global warming to well below 2°C, with efforts to limit it to 1.5°C, supported by necessary GHG emissions reductions).

⁸⁴ DNB (2023).

105. When addressing biodiversity risks, the objectives and targets set by global and EU strategies can serve as a basis for an undertaking's narrative on transition risks and help guide targets aimed at minimizing negative biodiversity impacts financed by the insurer.

Box 13: Global and EU targets on biodiversity

The **Kunming-Montreal Global Biodiversity Framework** agreed in December 2022 sets targets for a transition pathway to protect and restore biodiversity. Governments are responsible for implementing these targets, while economic and financial market participants are expected to align their activities accordingly. Before COP2024, countries must prepare updated National Biodiversity Strategies and Action Plans as well as National Biodiversity Finance Strategies. The upcoming COPs will consider whether the cumulative impact of the national actions is sufficient to reach the global goals and targets for 2030 and 2050.⁸⁵

At the EU level, the **EU Biodiversity Strategy** aims put Europe's biodiversity on the path to recovery by 2030. This includes achieving legal protection for at least 30 % of the EU's land area and sea areas and restoring significant areas of degraded and carbon-rich ecosystems by 2030. The strategy also seeks to ensure that habitats and species do not experience further deterioration in conservation trends or status, with at least 30 % to reach a favourable conservation status or showing a positive trend.⁸⁶ The **Nature Restoration Law**⁸⁷ implements binding targets to restore degraded ecosystems, particularly those with the most potential to capture and store carbon, and to prevent and reduce the impact of natural disasters. As an overall target, Member States are required to implement restoration measures in at least 20 % of the EU's land and sea areas by 2030. By 2050 such measures should be in place for all ecosystems that need restoration.

Other policy frameworks such as for example Europe's Farm to Fork strategy⁸⁸, which aims to implement a sustainable food system, can inform target setting for certain sectoral exposures.

Question to stakeholders:

⁸⁵ Secretariat of the UN Convention on Biological Diversity [CBD] (2022): Kunming-Montreal Global Biodiversity Framework

⁸⁶ See European Commission (2020b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, EU Biodiversity Strategy for 2030. Bringing nature back into our lives

⁸⁷ See European Commission (2024). Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869 ⁸⁷ (**Nature Restoration Law**)

⁸⁸ See European Commission (2020a). Farm to fork strategy

Q10: Please share relevant examples of targets set by insurance undertakings to manage biodiversity risks. Where possible, please identify how these targets relate to global or EU biodiversity and nature conservation or restoration targets.

4.4.2 ACTIONS

106. Risk management action addressing biodiversity risks can range from identifying risks and setting the risk appetite to adapting the portfolio. The materiality and financial risk assessment contribute to identifying dependencies and impacts on nature and biodiversity, enable the integration of a biodiversity risk assessment into the underwriting or investment process to evaluate and anticipate the potential impact of biodiversity loss across sectors and regions, or support the use modelling tools to better understand and predict nature-related risk claims or asset valuation. This contributes to setting the undertakings' risk appetite.
107. Actions to manage material biodiversity risks can include de-risking and mitigation measures in investment and underwriting, that aim to reduce prudential risks or to reduce impacts. Assessing the actual financial risk reduction remains challenging in both cases. For example, excluding certain investments due to their negative impact on nature may be considered a risk-based strategy, but quantifying the effect of such exclusions on the undertaking's balance sheet is difficult. When applying exclusions to limit negative impacts of investments or underwriting it is relevant to specify how the exclusion contributes to limiting biodiversity loss, and potential also financial risk for the undertaking. It may be also relevant for undertakings to differentiate between biodiversity-specific exclusions and those related to other environmental issues.
108. Targeted investments or underwriting in order to contribute to biodiversity restoration or conservation, known as 'nature-based solutions' can help reducing transition and physical risks on the (re)insurers' balance sheets. Also here, the challenge lies in the assessment of how much risks are mitigated.

Derisking measures to reduce prudential risks or address negative biodiversity impacts

109. Derisking measures can include
- Developing an investment policy with sector-based exclusions for industries deemed harmful to nature and climate (due to the interconnection between biodiversity and climate).
 - Creating an investment policy with geographical exclusions that, although more difficult to implement, may be better suited to address biodiversity-related risks.
 - Diversifying investments across different geographical areas and asset classes to mitigate concentrated risks.
 - Define insurance exclusions in the underwriting policy for specific sectors or geographical areas that could be heavily impacted by biodiversity loss.
 - Define a methodical and consistent exclusion process that aligns with an overall biodiversity strategy, targeting at reducing impacts of the investment or underwriting activity on biodiversity.

110. Exclusion approaches require detailed information on the economic activities being financed or risk underwritten and their locations. These approaches become more complicated when investments are made through funds, as this requires engagement with all financial partners and relevant stakeholders. Additionally, exclusion approaches carry the risk of divesting or withdrawing insurance cover from economic sectors, which may have broader economic consequences.

Targeted investments or underwriting to contribute to biodiversity ('nature-based') and engagement strategies

111. The European Commission defines nature-based solutions as “solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience. Such solutions bring more, and more diverse, nature and natural features and processes into cities, landscapes and seascapes, through locally adapted, resource-efficient and systemic interventions.” Nature-based solutions support key EU policy priorities, particularly the European Green Deal, the EU Biodiversity Strategy and Climate Adaptation strategy, to foster biodiversity and make Europe more climate-resilient.⁸⁹

112. (Re)insurers' investment or underwriting strategies can contribute to funding or covering risks for nature-based solutions, aimed at protecting and restoring biodiversity and ecosystem services and incentivise adaptation ('impact underwriting').

113. Such decisions can help reduce transition and physical risks on the (re)insurers' balance sheets. The nature-related externalities generated by the insurance industry through its investment or underwriting activities provide a basis for identifying how (re)insurers can target nature-based solutions. Insurers can assess their investees' and/or policyholders' nature-related footprint or dependency, serving as input for science-based due diligence requirements to identify, monitor, and mitigate the most significant impacts.

114. These approaches complement investment and underwriting policies by adopting a contributory approach to biodiversity. This approach, which seems easier to implement, involves identifying economic players or sectors whose financing will positively impact the preservation and restoration of biodiversity. Such investments or underwriting can include companies focused on conserving animal species or cleaning up pollution, as well as investments in asset classes that align with multiple ESG objectives, including biodiversity (e.g., green bonds focused on biodiversity). The challenge remains in ensuring the effective reduction of the impact and assessing potential reductions in financial risk for the undertakings' portfolio.

Box 14: Nature-based investment or underwriting activities considering the EU Taxonomy objectives

Based on the activities that can have a 'substantial contribution to the protection and restoration of biodiversity', according to the Taxonomy Regulation, nature-based investment or underwriting activities can aim at supporting the financing or the coverage of risks for activities related to:

⁸⁹ See European Commission, [Nature-based solutions research policy \(europa.eu\)](https://ec.europa.eu/euro-just/eioipa/nature-based-solutions-research-policy).

- a) nature and biodiversity conservation including achieving favourable conservation status of natural and semi-natural habitats and species or preventing their deterioration where they already have favourable conservation status, and protecting and restoring terrestrial, marine and other aquatic ecosystems in order to improve their condition and enhance their capacity to provide ecosystem services.
- b) sustainable land use and management, including adequate protection of soil biodiversity, land degradation neutrality and the remediation of contaminated sites.
- c) sustainable agricultural practices, including those that contribute to enhancing biodiversity or to halting or preventing the degradation of soils and other ecosystems, deforestation and habitat loss.
- d) sustainable forest management, including practices and uses of forests and forest land that contribute to enhancing biodiversity or to halting or preventing degradation of ecosystems, deforestation and habitat loss.⁹⁰

115. Broader engagement strategies allow insurers to leverage their influence to advance practices in the insurance market, creating a positive momentum toward policies that preserve biodiversity.

Question to stakeholders:

Q11: Please share relevant examples of actions which insurance undertakings can take to mitigate prudential biodiversity-related risks, including through nature-based investment and underwriting strategies.

Q12: Please share reference to relevant approaches to integrate biodiversity or nature-related data into cat modelling.

⁹⁰ Based on Article 17 Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a framework to facilitate sustainable investment, and amending Regulation (EU) 2019/2088 (**Taxonomy Regulation**).

5. CONCLUSIONS

116. Biodiversity loss can result in significant economic risks, potentially jeopardising financial stability. It can affect the value of investments, the frequency and intensity of insured losses, and the overall risk profile of insurers' portfolios. EIOPA's identified a significant investment exposure in the insurance sector to assets dependent on nature and ecosystem services, which may indicate an exposure to biodiversity risks. A lack of data prevents a comprehensive insight into the sector's underwriting exposure to biodiversity risk.

117. This report initiates the examination current practices and challenges in the identification, measurement, and management of biodiversity risks by insurer as part of the existing Solvency II risk management framework.

118. The report acknowledges the challenges to the integration of biodiversity risk assessment in insurers' risk management practices, which make actionable risk assessments difficult today. These challenges range from the limited capacity to identify the risks (linked to data limitation), to the complex nature of biodiversity (due to its regional specificities and its interlinkages with other environmental risks, including climate change):

- **Absence of a clear boundary with climate change risks.** The nexus between climate change and biodiversity loss potentially limits the risk assessment of specific biodiversity risks on asset classes or lines of business and introduces the risk of double counting.
- **Limited risk assessment capacity.** Lack of access to public and corporate data on local biodiversity risks hampers assessment. Incoming disclosures on biodiversity impacts under CSRD should help, but there is still limited access to geo-spatial data. Many biodiversity pressures are not yet modelled, and existing tools lack regional specificity.
- **Local biodiversity complexities.** Global models and metrics struggle to capture local biodiversity risks. Specific regional scenarios are needed for certain portfolios and regions.

119. As a result, an analysis of market practices indicates that the identification, measurement and management of biodiversity risks by the insurance industry are still at an early stage, for underwriting activities.

- Some undertakings refer to potential biodiversity risks in their sustainability risk plans, but there is limited evidence of the assessment of material biodiversity risk in ORSAs. References to biodiversity in existing public sustainability plans primarily focus on governance arrangements and stewardship, with an emphasis on investment strategies.
- A few undertakings have analysed certain investments or underwriting activities, such as in the agro-forestry sector, which may be highly impacted by biodiversity risk. Some health-related exposures have also been identified, but they have not yet been further analysed in the ORSA.
- Most undertakings consider biodiversity to be an important but emerging risk - a 'megatrend' that is difficult to translate into concrete financial impacts on insurance activities. The most assumed risk is a potential negative impact on investments, such as a decrease in asset values.

120. Biodiversity risk is primarily viewed through the lens of reputational risk. Conducting biodiversity risk assessment under Solvency II would require moving beyond treating the risk as a mere potential reputational risk. This requires materiality assessments to be performed with adequate resources.
121. To foster convergent practices and ensure material biodiversity risks are duly considered in the ORSA, the Report includes practices for the performance of biodiversity risk assessments in Solvency II, with the aim to engage supervisors and the insurance sector in identifying the potential relevance of the risk.
122. While noting the limitations in setting clear boundaries, biodiversity risk should not be assessed solely through the lens of climate change, and insurers should consider the potential existence of biodiversity-specific and often localized risks, regional data and scenarios in parts of their portfolios. This may include lines of business and investments which may be heavily exposed to biodiversity risk forestry, agriculture, and health-related activities. At the same time, it is necessary to ensure that the biodiversity risk assessment is consistent with climate risk assessment, to prevent double counting risks. For natural catastrophe risk assessment, the mutually reinforcing effects of the risks and adaptation measures need to be considered. The use of integrated scenarios, or the integration of biodiversity risk indicators in natural catastrophe modelling may need to be considered going forward.
123. While financial risk scenarios are not easily available or applicable, insurers should base assessments on plausible but extreme scenarios relevant to their risk profiles. Multiple biodiversity risk scenarios may be necessary, depending on regions and business areas. Improved data collection and the use of common metrics to monitor biodiversity loss in insurance activities should be pursued. Small and non-complex undertakings and (re)insurance captives should benefit from the use of qualitative approaches to assess their financial risk, while quantitative approaches should be endeavored with available data.
124. Engagement with investees and policyholders in areas with critical and material exposures is a critical step in identifying and monitoring risks. When investing or underwriting with nature-positive objectives, undertakings should also consider use a risk-based approach to monitor the mitigating effects of these measures.

Question to stakeholders:

Q13: Do you agree on these preliminary conclusions? Which additional practices should be highlighted?

ANNEX I THE INSURANCE SECTOR'S EXPOSURE TO BIODIVERSITY RISK

INVESTMENT EXPOSURE ASSESSMENT

Data sources: Solvency II QRT sources for the assessment of investment exposure to biodiversity risk

Reported data on investments allows to perform exposure analysis to physical and transition risks. Notably, analyses on direct equity (CIC3) and corporate bond (CIC2) holdings, as well as direct investments in real estate (CIC9). Equity and corporate bond holdings are reported on security-level, with corresponding issuer identifier (e.g. LEI), issuer country and NACE sector of economic activity. Real estate investments are reported by country and as of 2023-Q4, also with an address.

S.06.02 — List of assets: this template contains an item-by-item list of assets held directly by the undertaking (i.e. not on a look-through basis), classifiable as asset categories 0 to 9 [CIC categories].

Exposure assessment

EIOPA assessed the dependency on ecosystem services of insurers' corporate bond and equity investments following Ceglar et al. (2023)⁹¹. The methodology relies on the ENCORE tool⁹², which provides a set of materiality scores for dependencies on ecosystem services for economic activities. The higher the materiality score, the higher the dependency on a given ecosystem service and the larger the effect of a change in provision of the ecosystem service on the production process and ultimately the financial performance of that economic activity. The ENCORE data is enhanced by the input-output table EXIOBASE, thus also capturing upstream dependencies along the supply chain for an economic activity. While EXIOBASE is country-specific, the original ENCORE materiality scores do not differ across geographies.

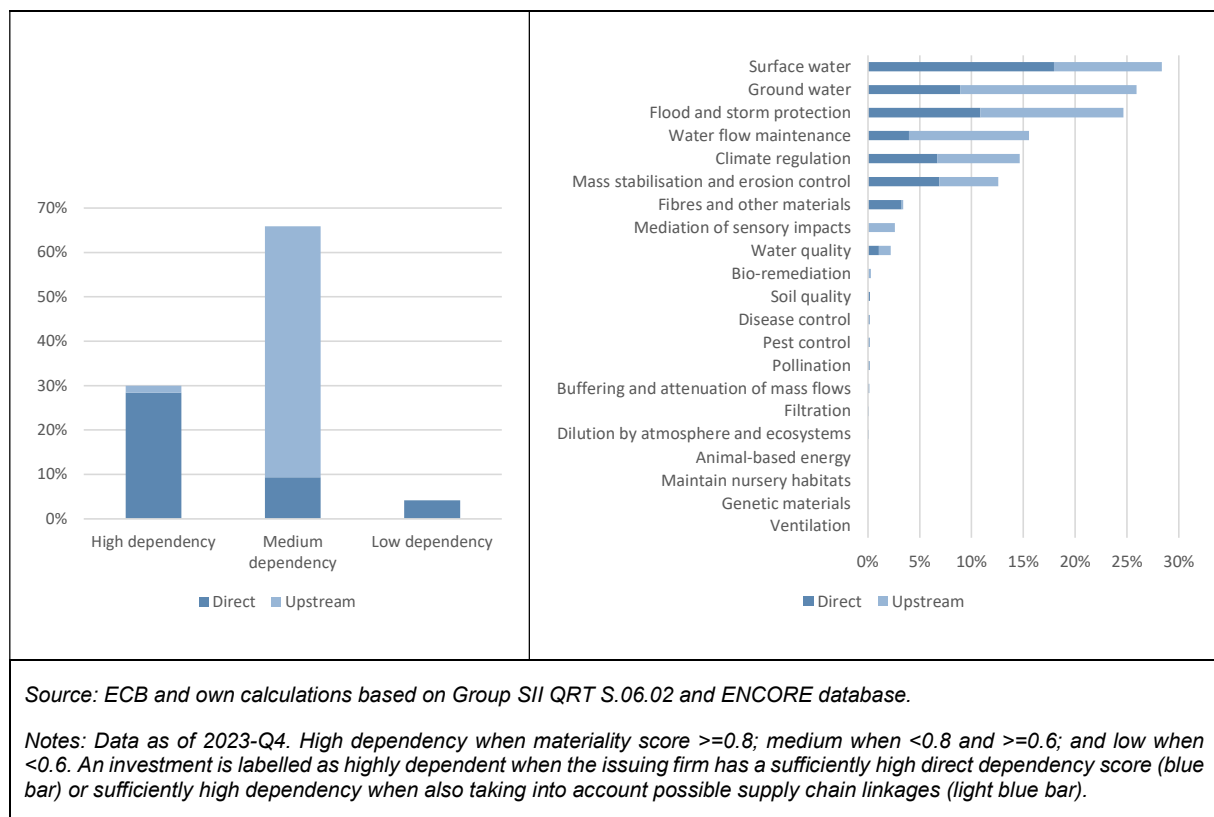
Applied to EEA insurers' direct investments in corporate bonds and equity, amounting to approximately 2.3 tn. EUR, 30% of these investments are towards economic activities that highly depend on at least one ecosystem service. Compared to direct dependencies only, accounting also for upstream dependencies along the supply chain increases the materiality to a medium dependency on at least one ecosystem service for most of the portfolio, while the highly dependent share increases only slightly.

The main exposures within portfolios of corporate securities are towards surface and ground water, as well as flood and storm protection. Insurers invest a large part of their portfolio (approximately 48%) in securities issued by financial firms, which also make up the largest part of the exposures with a medium dependency on at least one ecosystem service. As the methodology relies on a mapping to the sector of economic activity and its value chain via input-output tables, the indirect dependency on ecosystem services through an investee banks' loan book might not fully be captured.

⁹¹ ECB (2023). Occasional Paper Series No 333. Living in a world of disappearing nature: physical risk and the implications for financial stability.

⁹² ENCORE (encorenature.org).

Figure 5: Maximum direct and upstream dependency on ecosystem services of insurers' corporate bond and equity portfolio



UNDERWRITING EXPOSURE ASSESSMENT

Data sources: Solvency II QRT sources for the assessment of underwriting exposure to biodiversity risk

Reported data on underwriting activity only allows for a broad categorisation per (Solvency II) line of business and the country of risk/underwriting. This data can be combined, for example, with country-average indicators on biodiversity (e.g. Biodiversity Intactness Index). The underwriting portfolio cannot be assessed according to the sector of economic activity, which is for example relevant for the assessment of potential exposure to business interruption claims. Another difficulty is the classification by line-of-business (LoB), for example not allowing to identify crop insurance or the specific risks insured.

For example,

- S.04.05 — Activity by country – location of risk: Undertakings shall report on a country-by-country basis for at least 95% of gross written premium. All business shall be reported, however, any residual business over the 95% threshold may be grouped as “other countries”.
- S.17.03 — Non-Life Technical Provisions — by country: Information reported by country shall at least represent 90 % of the total Technical Provisions as a whole and Gross Best Estimate (referred

to direct business) of any line of business. For the direct insurance business for the lines of business 'Medical expense', 'Income protection', 'Workers' compensation', 'Fire and other damage to property' and 'Credit and suretyship' information shall be reported by country where the risk is situated, for all other lines of business it shall be reported by country where the contract was entered into.

- **S.21.02 — Underwriting risks non-life:** In this template the 20 biggest single underwriting risks, based on net retention, across all lines of business, as defined in Annex I to Delegated Regulation (EU) 2015/35, shall be reported. If the 2 biggest single underwriting risks for any of the lines of business, as defined in Annex I to Delegated Regulation (EU) 2015/35 are not covered through the above methodology, then they shall be reported in addition. In case a single underwriting risk of a specific line of business forms part of the top 20, the same risk of the affected line of business must only be filled in once.

Exposure assessment

An attempt was made to assess underwriting exposures based on reported data (SII QRT S.17.03). This underwriting data is only available at aggregated level, which merely allows for a broad categorisation per line of business (LoB) and the country of risk/underwriting based. For the analysis, the data was combined with the Biodiversity Intactness Index (BII) from the Natural History Museum, which is an estimated percentage of the original number of species that remain and their abundance in any given area, despite human impacts.⁹³

Combined with the reported data on technical provisions, the expected change in biodiversity intactness from 2015-2050 per LoB and country of risk/underwriting can be mapped. However, translating this into implications for insurers or even a risk analysis for underwriting is however not possible, for three main reasons. First, the underwriting portfolio cannot be assessed according to the sector of economic activity, which is for example relevant for the assessment of potential exposure to business interruption claims. Information on the sector of economic activity would further allow to map the data on underwriting to other data sources, such as ENCORE. Second, the classification by LoB does not allow to identify specific risks insured that might depend on biodiversity intactness, such as crop insurance. Lastly, exacerbating the previous two shortcomings, as the technical provisions are only reported at country-level, the BII can only be assessed at the country-level aggregation, thus eliminating a lot of the regional/local variance. For assessing implications or quantifying risks for insurers, more granularity in the data would thus be required.

Therefore, more granular data and further research is needed to perform undertakings' underwriting exposure to biodiversity risk.

⁹³ This data includes more than 54,000 species, encompassing not only birds and mammals, the groups most often used in biodiversity indicators, but also plants, fungi and insects. It thus captures the share of 'pristine' nature preserved, similar to biodiversity footprinting tools. Furthermore, it also provides estimates of future developments of the BII under different scenarios based on Shared Socioeconomic Pathways (SSPs).

ANNEX II SUMMARY OF QUESTIONS TO STAKEHOLDERS

Q1: In your view, should biodiversity risks be assessed together with climate risks, or subject to a dedicated risk assessment?

Q2: Would you agree that for financial risk assessment purposes, insurers could be guided by identifying their exposure of investments or liabilities to (i) economic activities that are dependent on biodiversity and ecosystem services and (ii) economic activities that impact biodiversity and ecosystems ('biodiversity footprint')?

Q3: Do you agree with the description of the transmission of biodiversity risk to insurers' assets and liabilities?

Q4: Do you identify relevant market practices of undertakings in describing their narrative on the impact of biodiversity risks to their business?

Q5: Please share relevant approaches, tools and practices for undertakings to perform sectoral and/or geographical biodiversity exposure risk assessment.

Q6: Please share relevant approaches, methodologies and reference to relevant data for assessing underwriting risk exposure to biodiversity losses.

Q7: Please share relevant approaches, tools and practices for undertakings to perform a financial risk assessment for biodiversity risk. Please provide reference to potential scenarios and models.

Q8: Please share references to relevant scenarios for assessing the financial risks of biodiversity loss for specific lines of business or exposures (e.g. agriculture, health, ...)

Q9: Please share references to relevant scenarios for integrated climate-biodiversity financial risk assessment.

Q10: Please share relevant examples of targets set by insurance undertakings to manage biodiversity risks. Where possible, please identify how these targets relate to global or EU biodiversity and nature conservation or restoration targets.

Q11: Please share relevant examples of actions which insurance undertakings can take to mitigate prudential biodiversity-related risks, including through nature-based investment and underwriting strategies.

Q12: Please share reference to relevant approaches to integrate biodiversity or nature-related data into cat modelling.

Q13: Do you agree on these preliminary conclusions? Which additional practices should be highlighted?

Q14: Do you have any other comments on the consultation paper?

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